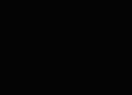




## 車両と状況に最適なEVパーツを選定

## Selecting the right EV Parts for the vehicle and conditions

## Input Parameters

| Motor                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Inverter                                                                          | Battery                                                                           | Gear                                                                              | Tire                                                                              | Vehicle                                                                             |               |            |               |            |               |                          |        |                                      |        |                              |        |                             |   |                         |      |                    |     |                    |     |                                                                                                                                                                                                                                                                                                                                  |           |       |          |        |          |        |           |          |           |        |          |        |                                                                                                                                                                                                                                                                               |           |       |                     |    |                               |   |                            |    |                                                                                                                                                                                                             |           |       |            |         |                    |        |                                                                                                                                                                                                                     |           |       |                           |    |                       |   |                                                                                                                                                                                                                                                                                                                                                        |           |       |                   |      |                     |     |                       |     |                  |   |             |   |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------|------------|---------------|------------|---------------|--------------------------|--------|--------------------------------------|--------|------------------------------|--------|-----------------------------|---|-------------------------|------|--------------------|-----|--------------------|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-------|----------|--------|----------|--------|-----------|----------|-----------|--------|----------|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-------|---------------------|----|-------------------------------|---|----------------------------|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-------|------------|---------|--------------------|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-------|---------------------------|----|-----------------------|---|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-------|-------------------|------|---------------------|-----|-----------------------|-----|------------------|---|-------------|---|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |  |  |  |    |               |            |               |            |               |                          |        |                                      |        |                              |        |                             |   |                         |      |                    |     |                    |     |                                                                                                                                                                                                                                                                                                                                  |           |       |          |        |          |        |           |          |           |        |          |        |                                                                                                                                                                                                                                                                               |           |       |                     |    |                               |   |                            |    |                                                                                                                                                                                                             |           |       |            |         |                    |        |                                                                                                                                                                                                                     |           |       |                           |    |                       |   |                                                                                                                                                                                                                                                                                                                                                        |           |       |                   |      |                     |     |                       |     |                  |   |             |   |
| <b>Encoder.mat</b><br><b>Motor1.mat</b><br><b>Needle1.mat</b><br><b>eMotor.mat</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>Inverter1.mat</b><br><b>inv1.mat</b><br><b>needleInv.mat</b>                   | <b>Battery1.mat</b><br><b>bat1.mat</b><br><b>batC.mat</b><br><b>needleBat.mat</b> | <b>Gear1.mat</b><br><b>gear1.mat</b><br><b>gearC.mat</b>                          | <b>Tire1.mat</b><br><b>tireC.mat</b><br><b>Type1.mat</b>                          | <b>CarA.mat</b><br><b>CarB.mat</b><br><b>Vehicle1.mat</b><br><b>VehicleBody.mat</b> |               |            |               |            |               |                          |        |                                      |        |                              |        |                             |   |                         |      |                    |     |                    |     |                                                                                                                                                                                                                                                                                                                                  |           |       |          |        |          |        |           |          |           |        |          |        |                                                                                                                                                                                                                                                                               |           |       |                     |    |                               |   |                            |    |                                                                                                                                                                                                             |           |       |            |         |                    |        |                                                                                                                                                                                                                     |           |       |                           |    |                       |   |                                                                                                                                                                                                                                                                                                                                                        |           |       |                   |      |                     |     |                       |     |                  |   |             |   |
| <table border="1"> <thead> <tr> <th>Parameter</th> <th>Value</th> </tr> </thead> <tbody> <tr><td>Pole</td><td>8</td></tr> <tr><td>Resistance(Z)</td><td>0.0127</td></tr> <tr><td>Voltage(V)</td><td>380</td></tr> <tr><td>Current(A)</td><td>600</td></tr> <tr><td>Coefficient of Iron Loss</td><td>0.2430</td></tr> <tr><td>Coefficient of Stray Loss (x1.5-0.9)</td><td>0.6000</td></tr> <tr><td>Coefficient of Friction Loss</td><td>0.0000</td></tr> <tr><td>Coefficient of Windage Loss</td><td>4</td></tr> <tr><td>Switching Frequency(Hz)</td><td>6000</td></tr> <tr><td>DC-link voltage(V)</td><td>380</td></tr> <tr><td>DC-link Current(A)</td><td>400</td></tr> </tbody> </table> | Parameter                                                                         | Value                                                                             | Pole                                                                              | 8                                                                                 | Resistance(Z)                                                                       | 0.0127        | Voltage(V) | 380           | Current(A) | 600           | Coefficient of Iron Loss | 0.2430 | Coefficient of Stray Loss (x1.5-0.9) | 0.6000 | Coefficient of Friction Loss | 0.0000 | Coefficient of Windage Loss | 4 | Switching Frequency(Hz) | 6000 | DC-link voltage(V) | 380 | DC-link Current(A) | 400 | <table border="1"> <thead> <tr> <th>Parameter</th> <th>Value</th> </tr> </thead> <tbody> <tr><td>fr (a/s)</td><td>0.0000</td></tr> <tr><td>fr (a/s)</td><td>0.1100</td></tr> <tr><td>inv (a/s)</td><td>124.7000</td></tr> <tr><td>inv (a/s)</td><td>0.7000</td></tr> <tr><td>fr (a/s)</td><td>0.0000</td></tr> </tbody> </table> | Parameter | Value | fr (a/s) | 0.0000 | fr (a/s) | 0.1100 | inv (a/s) | 124.7000 | inv (a/s) | 0.7000 | fr (a/s) | 0.0000 | <table border="1"> <thead> <tr> <th>Parameter</th> <th>Value</th> </tr> </thead> <tbody> <tr><td>Battery charge (Wh)</td><td>80</td></tr> <tr><td>Regeneration ratio (for up*7)</td><td>1</td></tr> <tr><td>Regeneration limit (a/s*h)</td><td>16</td></tr> </tbody> </table> | Parameter | Value | Battery charge (Wh) | 80 | Regeneration ratio (for up*7) | 1 | Regeneration limit (a/s*h) | 16 | <table border="1"> <thead> <tr> <th>Parameter</th> <th>Value</th> </tr> </thead> <tbody> <tr><td>Gear ratio</td><td>10.0000</td></tr> <tr><td>Shaft diameter (m)</td><td>0.0500</td></tr> </tbody> </table> | Parameter | Value | Gear ratio | 10.0000 | Shaft diameter (m) | 0.0500 | <table border="1"> <thead> <tr> <th>Parameter</th> <th>Value</th> </tr> </thead> <tbody> <tr><td>Tire Outer diameter (m/s)</td><td>27</td></tr> <tr><td>Weight of a tire (kg)</td><td>1</td></tr> </tbody> </table> | Parameter | Value | Tire Outer diameter (m/s) | 27 | Weight of a tire (kg) | 1 | <table border="1"> <thead> <tr> <th>Parameter</th> <th>Value</th> </tr> </thead> <tbody> <tr><td>Clear Weight (kg)</td><td>1000</td></tr> <tr><td>Loosage weight (kg)</td><td>140</td></tr> <tr><td>Passenger weight (kg)</td><td>130</td></tr> <tr><td>Passenger number</td><td>4</td></tr> <tr><td>Tire number</td><td>4</td></tr> </tbody> </table> | Parameter | Value | Clear Weight (kg) | 1000 | Loosage weight (kg) | 140 | Passenger weight (kg) | 130 | Passenger number | 4 | Tire number | 4 |
| Parameter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Value                                                                             |                                                                                   |                                                                                   |                                                                                   |                                                                                     |               |            |               |            |               |                          |        |                                      |        |                              |        |                             |   |                         |      |                    |     |                    |     |                                                                                                                                                                                                                                                                                                                                  |           |       |          |        |          |        |           |          |           |        |          |        |                                                                                                                                                                                                                                                                               |           |       |                     |    |                               |   |                            |    |                                                                                                                                                                                                             |           |       |            |         |                    |        |                                                                                                                                                                                                                     |           |       |                           |    |                       |   |                                                                                                                                                                                                                                                                                                                                                        |           |       |                   |      |                     |     |                       |     |                  |   |             |   |
| Pole                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 8                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |               |            |               |            |               |                          |        |                                      |        |                              |        |                             |   |                         |      |                    |     |                    |     |                                                                                                                                                                                                                                                                                                                                  |           |       |          |        |          |        |           |          |           |        |          |        |                                                                                                                                                                                                                                                                               |           |       |                     |    |                               |   |                            |    |                                                                                                                                                                                                             |           |       |            |         |                    |        |                                                                                                                                                                                                                     |           |       |                           |    |                       |   |                                                                                                                                                                                                                                                                                                                                                        |           |       |                   |      |                     |     |                       |     |                  |   |             |   |
| Resistance(Z)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.0127                                                                            |                                                                                   |                                                                                   |                                                                                   |                                                                                     |               |            |               |            |               |                          |        |                                      |        |                              |        |                             |   |                         |      |                    |     |                    |     |                                                                                                                                                                                                                                                                                                                                  |           |       |          |        |          |        |           |          |           |        |          |        |                                                                                                                                                                                                                                                                               |           |       |                     |    |                               |   |                            |    |                                                                                                                                                                                                             |           |       |            |         |                    |        |                                                                                                                                                                                                                     |           |       |                           |    |                       |   |                                                                                                                                                                                                                                                                                                                                                        |           |       |                   |      |                     |     |                       |     |                  |   |             |   |
| Voltage(V)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 380                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                     |               |            |               |            |               |                          |        |                                      |        |                              |        |                             |   |                         |      |                    |     |                    |     |                                                                                                                                                                                                                                                                                                                                  |           |       |          |        |          |        |           |          |           |        |          |        |                                                                                                                                                                                                                                                                               |           |       |                     |    |                               |   |                            |    |                                                                                                                                                                                                             |           |       |            |         |                    |        |                                                                                                                                                                                                                     |           |       |                           |    |                       |   |                                                                                                                                                                                                                                                                                                                                                        |           |       |                   |      |                     |     |                       |     |                  |   |             |   |
| Current(A)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 600                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                     |               |            |               |            |               |                          |        |                                      |        |                              |        |                             |   |                         |      |                    |     |                    |     |                                                                                                                                                                                                                                                                                                                                  |           |       |          |        |          |        |           |          |           |        |          |        |                                                                                                                                                                                                                                                                               |           |       |                     |    |                               |   |                            |    |                                                                                                                                                                                                             |           |       |            |         |                    |        |                                                                                                                                                                                                                     |           |       |                           |    |                       |   |                                                                                                                                                                                                                                                                                                                                                        |           |       |                   |      |                     |     |                       |     |                  |   |             |   |
| Coefficient of Iron Loss                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 0.2430                                                                            |                                                                                   |                                                                                   |                                                                                   |                                                                                     |               |            |               |            |               |                          |        |                                      |        |                              |        |                             |   |                         |      |                    |     |                    |     |                                                                                                                                                                                                                                                                                                                                  |           |       |          |        |          |        |           |          |           |        |          |        |                                                                                                                                                                                                                                                                               |           |       |                     |    |                               |   |                            |    |                                                                                                                                                                                                             |           |       |            |         |                    |        |                                                                                                                                                                                                                     |           |       |                           |    |                       |   |                                                                                                                                                                                                                                                                                                                                                        |           |       |                   |      |                     |     |                       |     |                  |   |             |   |
| Coefficient of Stray Loss (x1.5-0.9)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 0.6000                                                                            |                                                                                   |                                                                                   |                                                                                   |                                                                                     |               |            |               |            |               |                          |        |                                      |        |                              |        |                             |   |                         |      |                    |     |                    |     |                                                                                                                                                                                                                                                                                                                                  |           |       |          |        |          |        |           |          |           |        |          |        |                                                                                                                                                                                                                                                                               |           |       |                     |    |                               |   |                            |    |                                                                                                                                                                                                             |           |       |            |         |                    |        |                                                                                                                                                                                                                     |           |       |                           |    |                       |   |                                                                                                                                                                                                                                                                                                                                                        |           |       |                   |      |                     |     |                       |     |                  |   |             |   |
| Coefficient of Friction Loss                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0.0000                                                                            |                                                                                   |                                                                                   |                                                                                   |                                                                                     |               |            |               |            |               |                          |        |                                      |        |                              |        |                             |   |                         |      |                    |     |                    |     |                                                                                                                                                                                                                                                                                                                                  |           |       |          |        |          |        |           |          |           |        |          |        |                                                                                                                                                                                                                                                                               |           |       |                     |    |                               |   |                            |    |                                                                                                                                                                                                             |           |       |            |         |                    |        |                                                                                                                                                                                                                     |           |       |                           |    |                       |   |                                                                                                                                                                                                                                                                                                                                                        |           |       |                   |      |                     |     |                       |     |                  |   |             |   |
| Coefficient of Windage Loss                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 4                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |               |            |               |            |               |                          |        |                                      |        |                              |        |                             |   |                         |      |                    |     |                    |     |                                                                                                                                                                                                                                                                                                                                  |           |       |          |        |          |        |           |          |           |        |          |        |                                                                                                                                                                                                                                                                               |           |       |                     |    |                               |   |                            |    |                                                                                                                                                                                                             |           |       |            |         |                    |        |                                                                                                                                                                                                                     |           |       |                           |    |                       |   |                                                                                                                                                                                                                                                                                                                                                        |           |       |                   |      |                     |     |                       |     |                  |   |             |   |
| Switching Frequency(Hz)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 6000                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                     |               |            |               |            |               |                          |        |                                      |        |                              |        |                             |   |                         |      |                    |     |                    |     |                                                                                                                                                                                                                                                                                                                                  |           |       |          |        |          |        |           |          |           |        |          |        |                                                                                                                                                                                                                                                                               |           |       |                     |    |                               |   |                            |    |                                                                                                                                                                                                             |           |       |            |         |                    |        |                                                                                                                                                                                                                     |           |       |                           |    |                       |   |                                                                                                                                                                                                                                                                                                                                                        |           |       |                   |      |                     |     |                       |     |                  |   |             |   |
| DC-link voltage(V)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 380                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                     |               |            |               |            |               |                          |        |                                      |        |                              |        |                             |   |                         |      |                    |     |                    |     |                                                                                                                                                                                                                                                                                                                                  |           |       |          |        |          |        |           |          |           |        |          |        |                                                                                                                                                                                                                                                                               |           |       |                     |    |                               |   |                            |    |                                                                                                                                                                                                             |           |       |            |         |                    |        |                                                                                                                                                                                                                     |           |       |                           |    |                       |   |                                                                                                                                                                                                                                                                                                                                                        |           |       |                   |      |                     |     |                       |     |                  |   |             |   |
| DC-link Current(A)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 400                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                     |               |            |               |            |               |                          |        |                                      |        |                              |        |                             |   |                         |      |                    |     |                    |     |                                                                                                                                                                                                                                                                                                                                  |           |       |          |        |          |        |           |          |           |        |          |        |                                                                                                                                                                                                                                                                               |           |       |                     |    |                               |   |                            |    |                                                                                                                                                                                                             |           |       |            |         |                    |        |                                                                                                                                                                                                                     |           |       |                           |    |                       |   |                                                                                                                                                                                                                                                                                                                                                        |           |       |                   |      |                     |     |                       |     |                  |   |             |   |
| Parameter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Value                                                                             |                                                                                   |                                                                                   |                                                                                   |                                                                                     |               |            |               |            |               |                          |        |                                      |        |                              |        |                             |   |                         |      |                    |     |                    |     |                                                                                                                                                                                                                                                                                                                                  |           |       |          |        |          |        |           |          |           |        |          |        |                                                                                                                                                                                                                                                                               |           |       |                     |    |                               |   |                            |    |                                                                                                                                                                                                             |           |       |            |         |                    |        |                                                                                                                                                                                                                     |           |       |                           |    |                       |   |                                                                                                                                                                                                                                                                                                                                                        |           |       |                   |      |                     |     |                       |     |                  |   |             |   |
| fr (a/s)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 0.0000                                                                            |                                                                                   |                                                                                   |                                                                                   |                                                                                     |               |            |               |            |               |                          |        |                                      |        |                              |        |                             |   |                         |      |                    |     |                    |     |                                                                                                                                                                                                                                                                                                                                  |           |       |          |        |          |        |           |          |           |        |          |        |                                                                                                                                                                                                                                                                               |           |       |                     |    |                               |   |                            |    |                                                                                                                                                                                                             |           |       |            |         |                    |        |                                                                                                                                                                                                                     |           |       |                           |    |                       |   |                                                                                                                                                                                                                                                                                                                                                        |           |       |                   |      |                     |     |                       |     |                  |   |             |   |
| fr (a/s)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 0.1100                                                                            |                                                                                   |                                                                                   |                                                                                   |                                                                                     |               |            |               |            |               |                          |        |                                      |        |                              |        |                             |   |                         |      |                    |     |                    |     |                                                                                                                                                                                                                                                                                                                                  |           |       |          |        |          |        |           |          |           |        |          |        |                                                                                                                                                                                                                                                                               |           |       |                     |    |                               |   |                            |    |                                                                                                                                                                                                             |           |       |            |         |                    |        |                                                                                                                                                                                                                     |           |       |                           |    |                       |   |                                                                                                                                                                                                                                                                                                                                                        |           |       |                   |      |                     |     |                       |     |                  |   |             |   |
| inv (a/s)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 124.7000                                                                          |                                                                                   |                                                                                   |                                                                                   |                                                                                     |               |            |               |            |               |                          |        |                                      |        |                              |        |                             |   |                         |      |                    |     |                    |     |                                                                                                                                                                                                                                                                                                                                  |           |       |          |        |          |        |           |          |           |        |          |        |                                                                                                                                                                                                                                                                               |           |       |                     |    |                               |   |                            |    |                                                                                                                                                                                                             |           |       |            |         |                    |        |                                                                                                                                                                                                                     |           |       |                           |    |                       |   |                                                                                                                                                                                                                                                                                                                                                        |           |       |                   |      |                     |     |                       |     |                  |   |             |   |
| inv (a/s)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 0.7000                                                                            |                                                                                   |                                                                                   |                                                                                   |                                                                                     |               |            |               |            |               |                          |        |                                      |        |                              |        |                             |   |                         |      |                    |     |                    |     |                                                                                                                                                                                                                                                                                                                                  |           |       |          |        |          |        |           |          |           |        |          |        |                                                                                                                                                                                                                                                                               |           |       |                     |    |                               |   |                            |    |                                                                                                                                                                                                             |           |       |            |         |                    |        |                                                                                                                                                                                                                     |           |       |                           |    |                       |   |                                                                                                                                                                                                                                                                                                                                                        |           |       |                   |      |                     |     |                       |     |                  |   |             |   |
| fr (a/s)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 0.0000                                                                            |                                                                                   |                                                                                   |                                                                                   |                                                                                     |               |            |               |            |               |                          |        |                                      |        |                              |        |                             |   |                         |      |                    |     |                    |     |                                                                                                                                                                                                                                                                                                                                  |           |       |          |        |          |        |           |          |           |        |          |        |                                                                                                                                                                                                                                                                               |           |       |                     |    |                               |   |                            |    |                                                                                                                                                                                                             |           |       |            |         |                    |        |                                                                                                                                                                                                                     |           |       |                           |    |                       |   |                                                                                                                                                                                                                                                                                                                                                        |           |       |                   |      |                     |     |                       |     |                  |   |             |   |
| Parameter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Value                                                                             |                                                                                   |                                                                                   |                                                                                   |                                                                                     |               |            |               |            |               |                          |        |                                      |        |                              |        |                             |   |                         |      |                    |     |                    |     |                                                                                                                                                                                                                                                                                                                                  |           |       |          |        |          |        |           |          |           |        |          |        |                                                                                                                                                                                                                                                                               |           |       |                     |    |                               |   |                            |    |                                                                                                                                                                                                             |           |       |            |         |                    |        |                                                                                                                                                                                                                     |           |       |                           |    |                       |   |                                                                                                                                                                                                                                                                                                                                                        |           |       |                   |      |                     |     |                       |     |                  |   |             |   |
| Battery charge (Wh)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 80                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                     |               |            |               |            |               |                          |        |                                      |        |                              |        |                             |   |                         |      |                    |     |                    |     |                                                                                                                                                                                                                                                                                                                                  |           |       |          |        |          |        |           |          |           |        |          |        |                                                                                                                                                                                                                                                                               |           |       |                     |    |                               |   |                            |    |                                                                                                                                                                                                             |           |       |            |         |                    |        |                                                                                                                                                                                                                     |           |       |                           |    |                       |   |                                                                                                                                                                                                                                                                                                                                                        |           |       |                   |      |                     |     |                       |     |                  |   |             |   |
| Regeneration ratio (for up*7)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 1                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |               |            |               |            |               |                          |        |                                      |        |                              |        |                             |   |                         |      |                    |     |                    |     |                                                                                                                                                                                                                                                                                                                                  |           |       |          |        |          |        |           |          |           |        |          |        |                                                                                                                                                                                                                                                                               |           |       |                     |    |                               |   |                            |    |                                                                                                                                                                                                             |           |       |            |         |                    |        |                                                                                                                                                                                                                     |           |       |                           |    |                       |   |                                                                                                                                                                                                                                                                                                                                                        |           |       |                   |      |                     |     |                       |     |                  |   |             |   |
| Regeneration limit (a/s*h)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 16                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                     |               |            |               |            |               |                          |        |                                      |        |                              |        |                             |   |                         |      |                    |     |                    |     |                                                                                                                                                                                                                                                                                                                                  |           |       |          |        |          |        |           |          |           |        |          |        |                                                                                                                                                                                                                                                                               |           |       |                     |    |                               |   |                            |    |                                                                                                                                                                                                             |           |       |            |         |                    |        |                                                                                                                                                                                                                     |           |       |                           |    |                       |   |                                                                                                                                                                                                                                                                                                                                                        |           |       |                   |      |                     |     |                       |     |                  |   |             |   |
| Parameter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Value                                                                             |                                                                                   |                                                                                   |                                                                                   |                                                                                     |               |            |               |            |               |                          |        |                                      |        |                              |        |                             |   |                         |      |                    |     |                    |     |                                                                                                                                                                                                                                                                                                                                  |           |       |          |        |          |        |           |          |           |        |          |        |                                                                                                                                                                                                                                                                               |           |       |                     |    |                               |   |                            |    |                                                                                                                                                                                                             |           |       |            |         |                    |        |                                                                                                                                                                                                                     |           |       |                           |    |                       |   |                                                                                                                                                                                                                                                                                                                                                        |           |       |                   |      |                     |     |                       |     |                  |   |             |   |
| Gear ratio                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 10.0000                                                                           |                                                                                   |                                                                                   |                                                                                   |                                                                                     |               |            |               |            |               |                          |        |                                      |        |                              |        |                             |   |                         |      |                    |     |                    |     |                                                                                                                                                                                                                                                                                                                                  |           |       |          |        |          |        |           |          |           |        |          |        |                                                                                                                                                                                                                                                                               |           |       |                     |    |                               |   |                            |    |                                                                                                                                                                                                             |           |       |            |         |                    |        |                                                                                                                                                                                                                     |           |       |                           |    |                       |   |                                                                                                                                                                                                                                                                                                                                                        |           |       |                   |      |                     |     |                       |     |                  |   |             |   |
| Shaft diameter (m)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0.0500                                                                            |                                                                                   |                                                                                   |                                                                                   |                                                                                     |               |            |               |            |               |                          |        |                                      |        |                              |        |                             |   |                         |      |                    |     |                    |     |                                                                                                                                                                                                                                                                                                                                  |           |       |          |        |          |        |           |          |           |        |          |        |                                                                                                                                                                                                                                                                               |           |       |                     |    |                               |   |                            |    |                                                                                                                                                                                                             |           |       |            |         |                    |        |                                                                                                                                                                                                                     |           |       |                           |    |                       |   |                                                                                                                                                                                                                                                                                                                                                        |           |       |                   |      |                     |     |                       |     |                  |   |             |   |
| Parameter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Value                                                                             |                                                                                   |                                                                                   |                                                                                   |                                                                                     |               |            |               |            |               |                          |        |                                      |        |                              |        |                             |   |                         |      |                    |     |                    |     |                                                                                                                                                                                                                                                                                                                                  |           |       |          |        |          |        |           |          |           |        |          |        |                                                                                                                                                                                                                                                                               |           |       |                     |    |                               |   |                            |    |                                                                                                                                                                                                             |           |       |            |         |                    |        |                                                                                                                                                                                                                     |           |       |                           |    |                       |   |                                                                                                                                                                                                                                                                                                                                                        |           |       |                   |      |                     |     |                       |     |                  |   |             |   |
| Tire Outer diameter (m/s)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 27                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                     |               |            |               |            |               |                          |        |                                      |        |                              |        |                             |   |                         |      |                    |     |                    |     |                                                                                                                                                                                                                                                                                                                                  |           |       |          |        |          |        |           |          |           |        |          |        |                                                                                                                                                                                                                                                                               |           |       |                     |    |                               |   |                            |    |                                                                                                                                                                                                             |           |       |            |         |                    |        |                                                                                                                                                                                                                     |           |       |                           |    |                       |   |                                                                                                                                                                                                                                                                                                                                                        |           |       |                   |      |                     |     |                       |     |                  |   |             |   |
| Weight of a tire (kg)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 1                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |               |            |               |            |               |                          |        |                                      |        |                              |        |                             |   |                         |      |                    |     |                    |     |                                                                                                                                                                                                                                                                                                                                  |           |       |          |        |          |        |           |          |           |        |          |        |                                                                                                                                                                                                                                                                               |           |       |                     |    |                               |   |                            |    |                                                                                                                                                                                                             |           |       |            |         |                    |        |                                                                                                                                                                                                                     |           |       |                           |    |                       |   |                                                                                                                                                                                                                                                                                                                                                        |           |       |                   |      |                     |     |                       |     |                  |   |             |   |
| Parameter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Value                                                                             |                                                                                   |                                                                                   |                                                                                   |                                                                                     |               |            |               |            |               |                          |        |                                      |        |                              |        |                             |   |                         |      |                    |     |                    |     |                                                                                                                                                                                                                                                                                                                                  |           |       |          |        |          |        |           |          |           |        |          |        |                                                                                                                                                                                                                                                                               |           |       |                     |    |                               |   |                            |    |                                                                                                                                                                                                             |           |       |            |         |                    |        |                                                                                                                                                                                                                     |           |       |                           |    |                       |   |                                                                                                                                                                                                                                                                                                                                                        |           |       |                   |      |                     |     |                       |     |                  |   |             |   |
| Clear Weight (kg)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1000                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                     |               |            |               |            |               |                          |        |                                      |        |                              |        |                             |   |                         |      |                    |     |                    |     |                                                                                                                                                                                                                                                                                                                                  |           |       |          |        |          |        |           |          |           |        |          |        |                                                                                                                                                                                                                                                                               |           |       |                     |    |                               |   |                            |    |                                                                                                                                                                                                             |           |       |            |         |                    |        |                                                                                                                                                                                                                     |           |       |                           |    |                       |   |                                                                                                                                                                                                                                                                                                                                                        |           |       |                   |      |                     |     |                       |     |                  |   |             |   |
| Loosage weight (kg)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 140                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                     |               |            |               |            |               |                          |        |                                      |        |                              |        |                             |   |                         |      |                    |     |                    |     |                                                                                                                                                                                                                                                                                                                                  |           |       |          |        |          |        |           |          |           |        |          |        |                                                                                                                                                                                                                                                                               |           |       |                     |    |                               |   |                            |    |                                                                                                                                                                                                             |           |       |            |         |                    |        |                                                                                                                                                                                                                     |           |       |                           |    |                       |   |                                                                                                                                                                                                                                                                                                                                                        |           |       |                   |      |                     |     |                       |     |                  |   |             |   |
| Passenger weight (kg)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 130                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                     |               |            |               |            |               |                          |        |                                      |        |                              |        |                             |   |                         |      |                    |     |                    |     |                                                                                                                                                                                                                                                                                                                                  |           |       |          |        |          |        |           |          |           |        |          |        |                                                                                                                                                                                                                                                                               |           |       |                     |    |                               |   |                            |    |                                                                                                                                                                                                             |           |       |            |         |                    |        |                                                                                                                                                                                                                     |           |       |                           |    |                       |   |                                                                                                                                                                                                                                                                                                                                                        |           |       |                   |      |                     |     |                       |     |                  |   |             |   |
| Passenger number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 4                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |               |            |               |            |               |                          |        |                                      |        |                              |        |                             |   |                         |      |                    |     |                    |     |                                                                                                                                                                                                                                                                                                                                  |           |       |          |        |          |        |           |          |           |        |          |        |                                                                                                                                                                                                                                                                               |           |       |                     |    |                               |   |                            |    |                                                                                                                                                                                                             |           |       |            |         |                    |        |                                                                                                                                                                                                                     |           |       |                           |    |                       |   |                                                                                                                                                                                                                                                                                                                                                        |           |       |                   |      |                     |     |                       |     |                  |   |             |   |
| Tire number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 4                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                     |               |            |               |            |               |                          |        |                                      |        |                              |        |                             |   |                         |      |                    |     |                    |     |                                                                                                                                                                                                                                                                                                                                  |           |       |          |        |          |        |           |          |           |        |          |        |                                                                                                                                                                                                                                                                               |           |       |                     |    |                               |   |                            |    |                                                                                                                                                                                                             |           |       |            |         |                    |        |                                                                                                                                                                                                                     |           |       |                           |    |                       |   |                                                                                                                                                                                                                                                                                                                                                        |           |       |                   |      |                     |     |                       |     |                  |   |             |   |
| <div>Add</div> <div>Exit</div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <div>Add</div> <div>Exit</div>                                                    | <div>Add</div> <div>Exit</div>                                                    | <div>Add</div> <div>Exit</div>                                                    | <div>Add</div> <div>Exit</div>                                                    | <div>Add</div> <div>Exit</div>                                                      |               |            |               |            |               |                          |        |                                      |        |                              |        |                             |   |                         |      |                    |     |                    |     |                                                                                                                                                                                                                                                                                                                                  |           |       |          |        |          |        |           |          |           |        |          |        |                                                                                                                                                                                                                                                                               |           |       |                     |    |                               |   |                            |    |                                                                                                                                                                                                             |           |       |            |         |                    |        |                                                                                                                                                                                                                     |           |       |                           |    |                       |   |                                                                                                                                                                                                                                                                                                                                                        |           |       |                   |      |                     |     |                       |     |                  |   |             |   |
| Selected item                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Motor1.mat                                                                        | Selected item                                                                     | invA.mat                                                                          | Selected item                                                                     | Battery1.mat                                                                        | Selected item | Gear1.mat  | Selected item | Tire1.mat  | Selected item | CarA.mat                 |        |                                      |        |                              |        |                             |   |                         |      |                    |     |                    |     |                                                                                                                                                                                                                                                                                                                                  |           |       |          |        |          |        |           |          |           |        |          |        |                                                                                                                                                                                                                                                                               |           |       |                     |    |                               |   |                            |    |                                                                                                                                                                                                             |           |       |            |         |                    |        |                                                                                                                                                                                                                     |           |       |                           |    |                       |   |                                                                                                                                                                                                                                                                                                                                                        |           |       |                   |      |                     |     |                       |     |                  |   |             |   |

## モータ選定 Motor Selection

どのE-Axleが最適？  
Which E-Axle is suitable?

## 回転数トルク特性 RPM-Torque Characteristics

最大トルクと最大回転数？  
What is the maximum torque and RPM?

## 運転条件 Operating Conditions

## 車両の速度と出力？ What is the vehicle speed and output power?

## 損失と発熱

### Losses and Heat Generation

銅損の推定、鉄損など  
Estimation of Copper loss, Iron loss, etc.

### 消費電力(WLTC走行)

### Electricity Consumption (WLTC driving)

## 1回充電でどれほどの距離を走行できる？ How far driving on a single charge?

## WLTC走行時の出力

慣性/重力/速度/空氣抵抗  
Inertia/ Gravity/ Speed/ Air resistance

**モータ効率**  
Motor Efficiency

## 自律走行での効率的な駆動方法？ How to drive efficiently in autonomous driving?

## 効率特性

### Efficiency Characteristics

## WLTC走行時の効率 Efficiency during WLTC driving

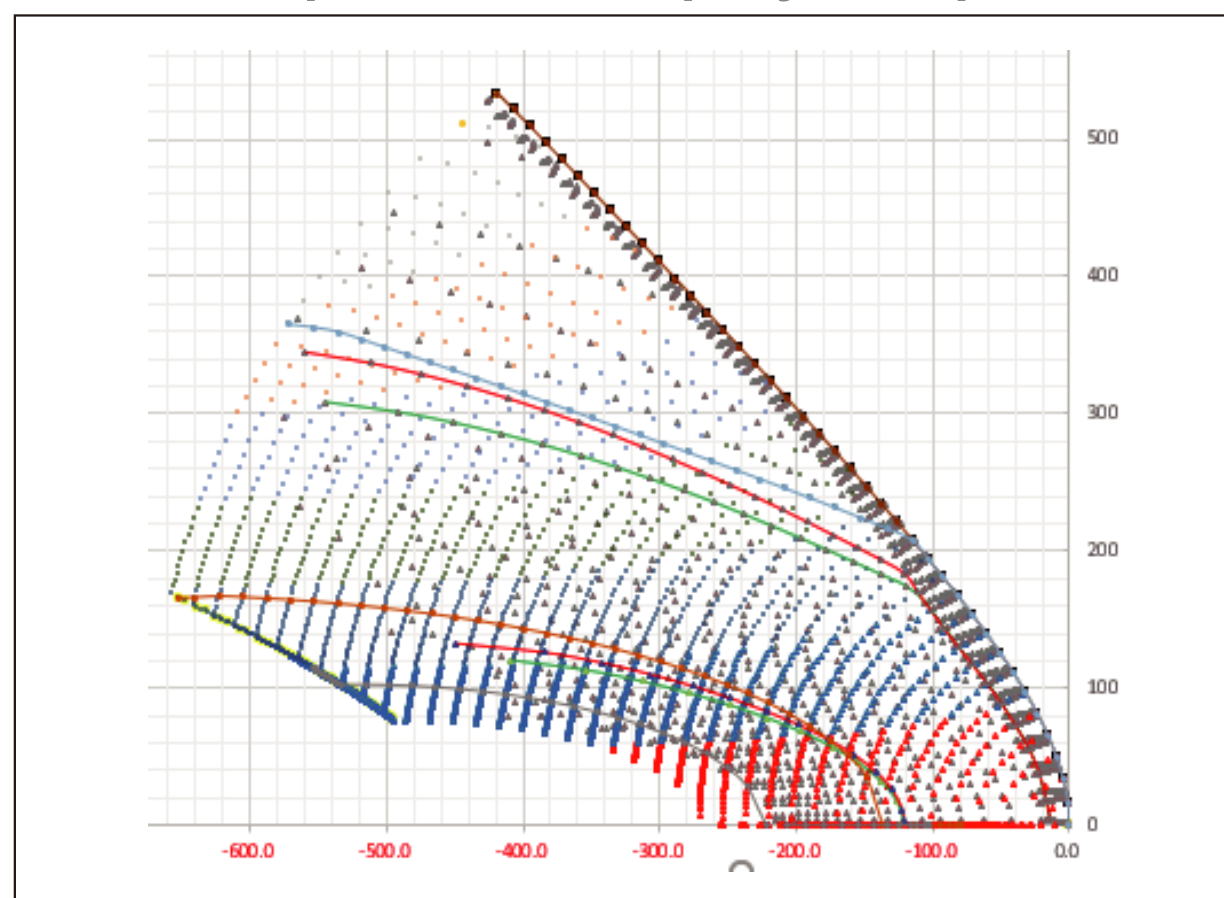
EV/HEVの車載駆動用モータやE-Axleの特性をシミュレーションするソフトウェア。  
車両条件や走行環境に合わせたモータ選定や、モータ試験時間の短縮に役立ちます。

**This software simulates the characteristics of EV/HEV in-vehicle drive motors and E-Axles. It helps select a motor that matches the vehicle conditions and driving environment and helps shorten motor testing time.**

## 現実と理論の整合性

Consistency of theory with reality

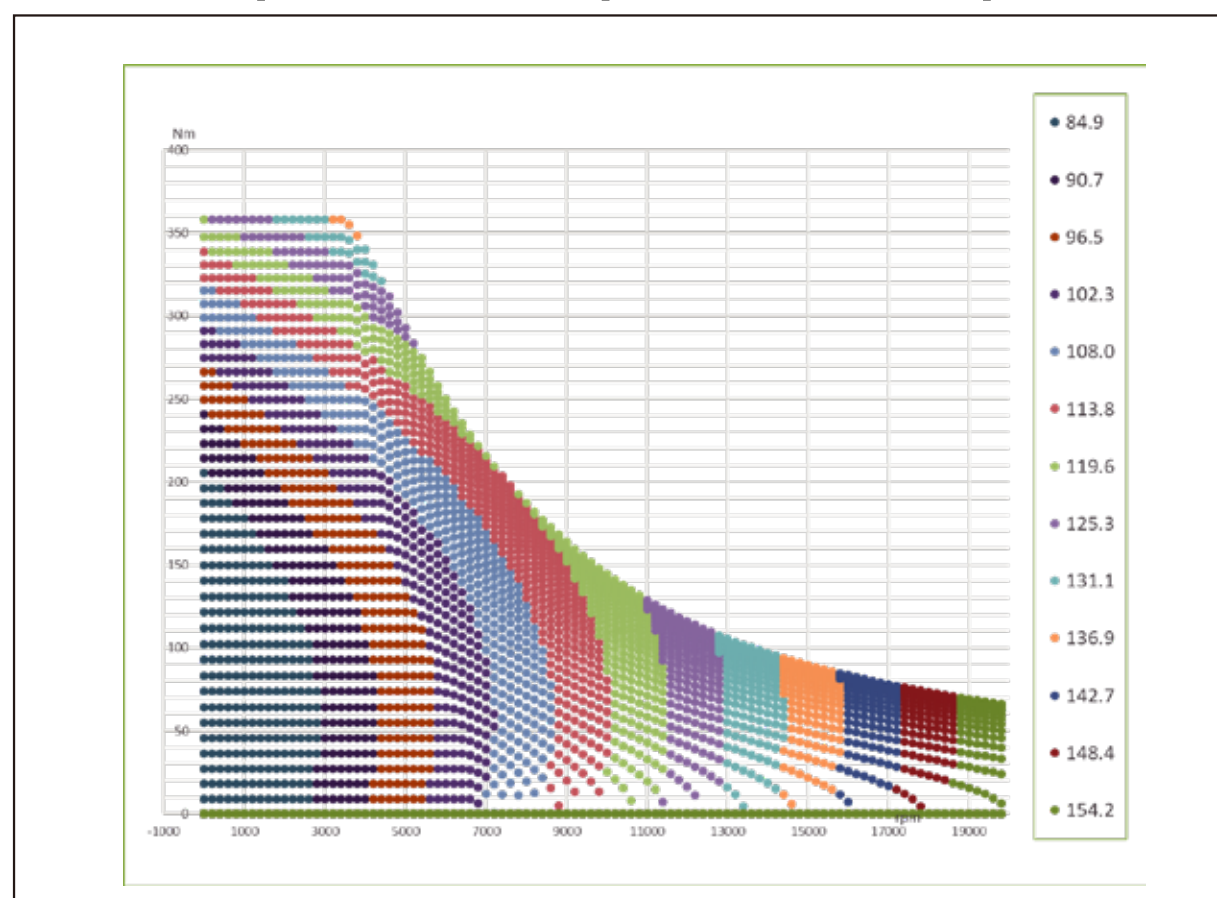
## Id Iq Control Map by Torque



## 温度マップ

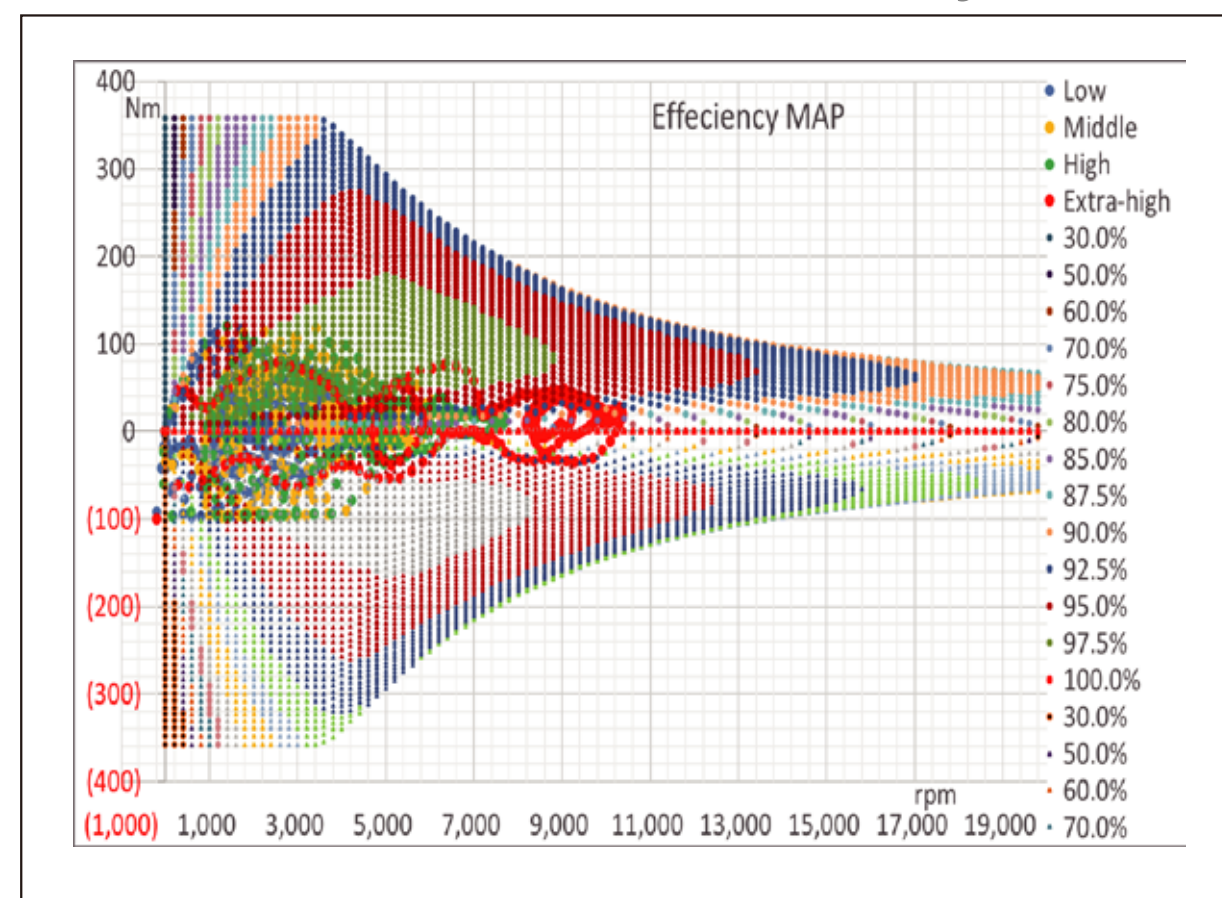
### Temperature Map

## Rpm/T&Temperature Map



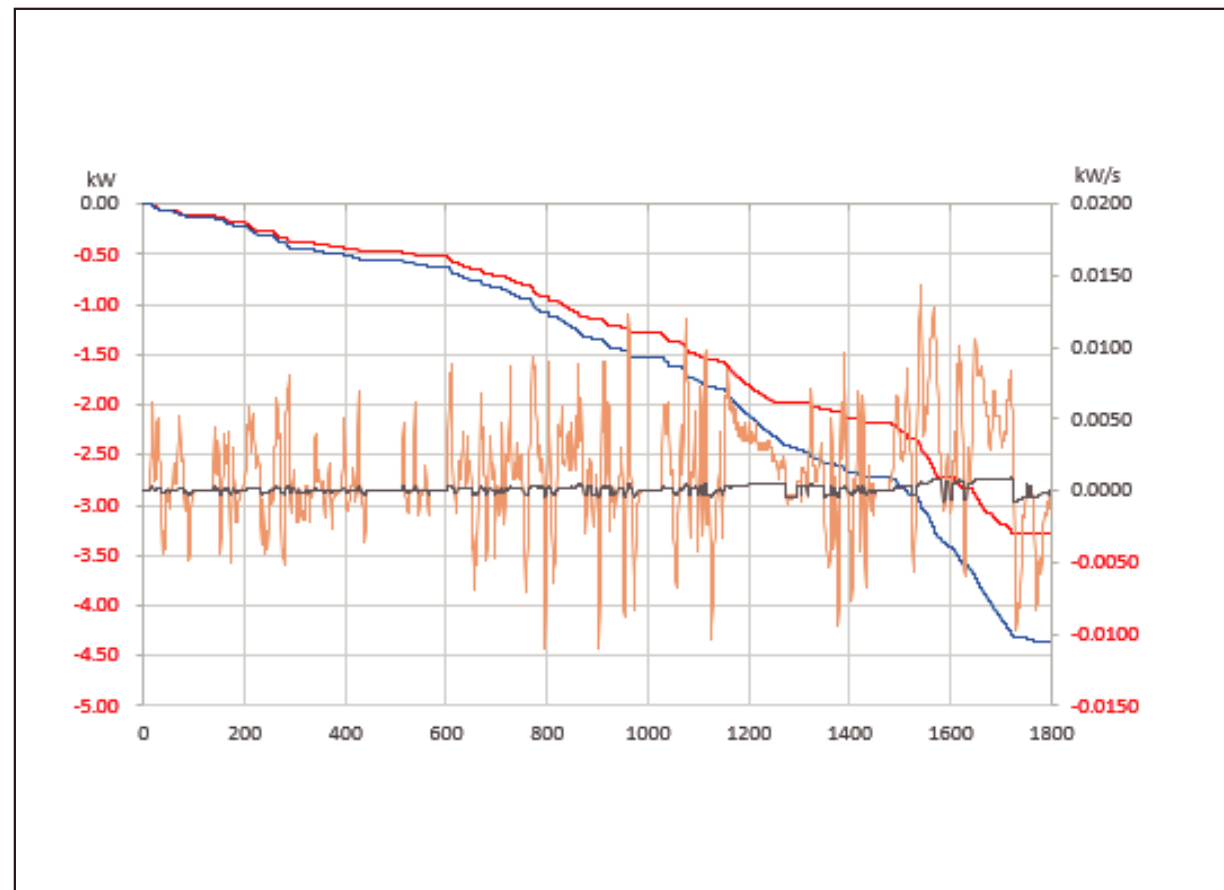
**WLTC : モータ効率**  
WLTC : Motor Efficiency

## WLTC : Motor Efficiency



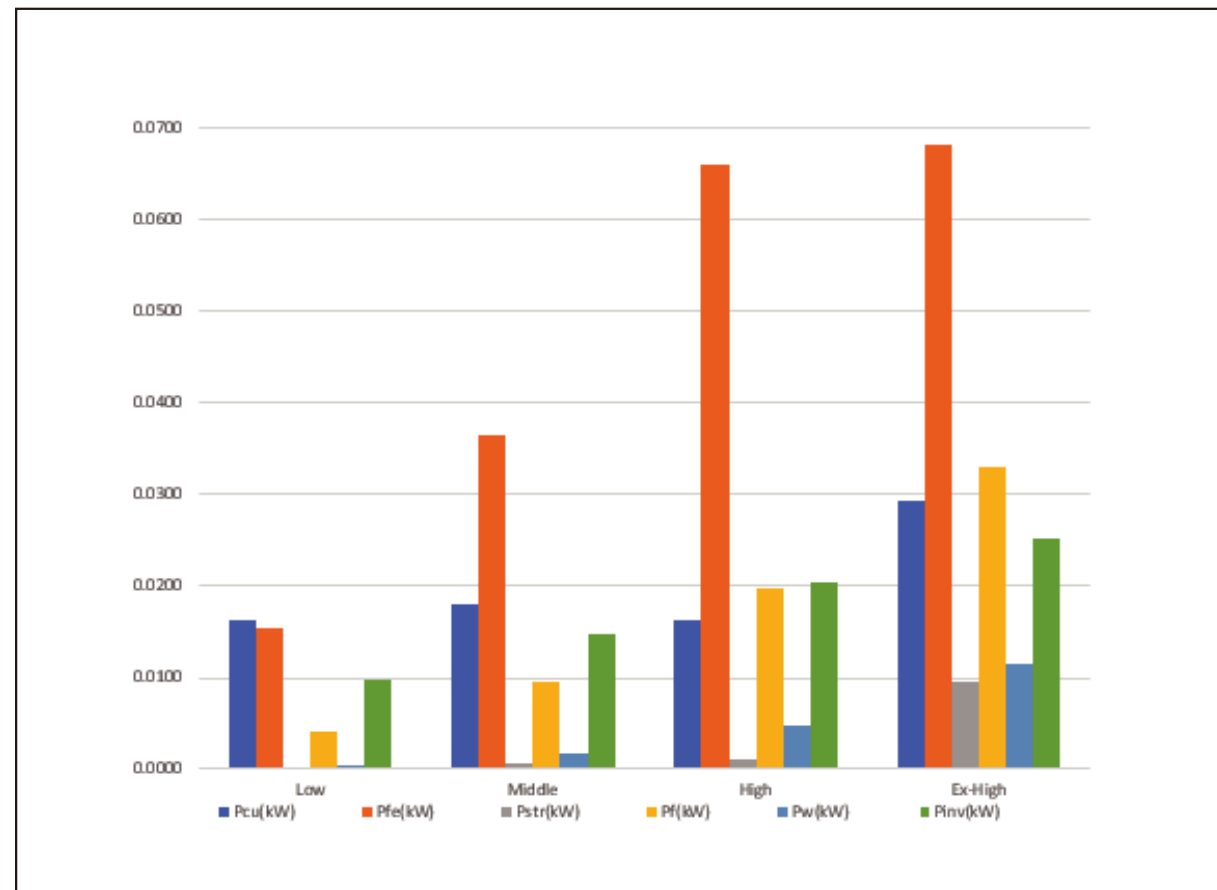
## クルージングパターン&BTT消費量

## WLTC(1800sec): BTT Power Consumption



## 損失内訳 (WLTC)

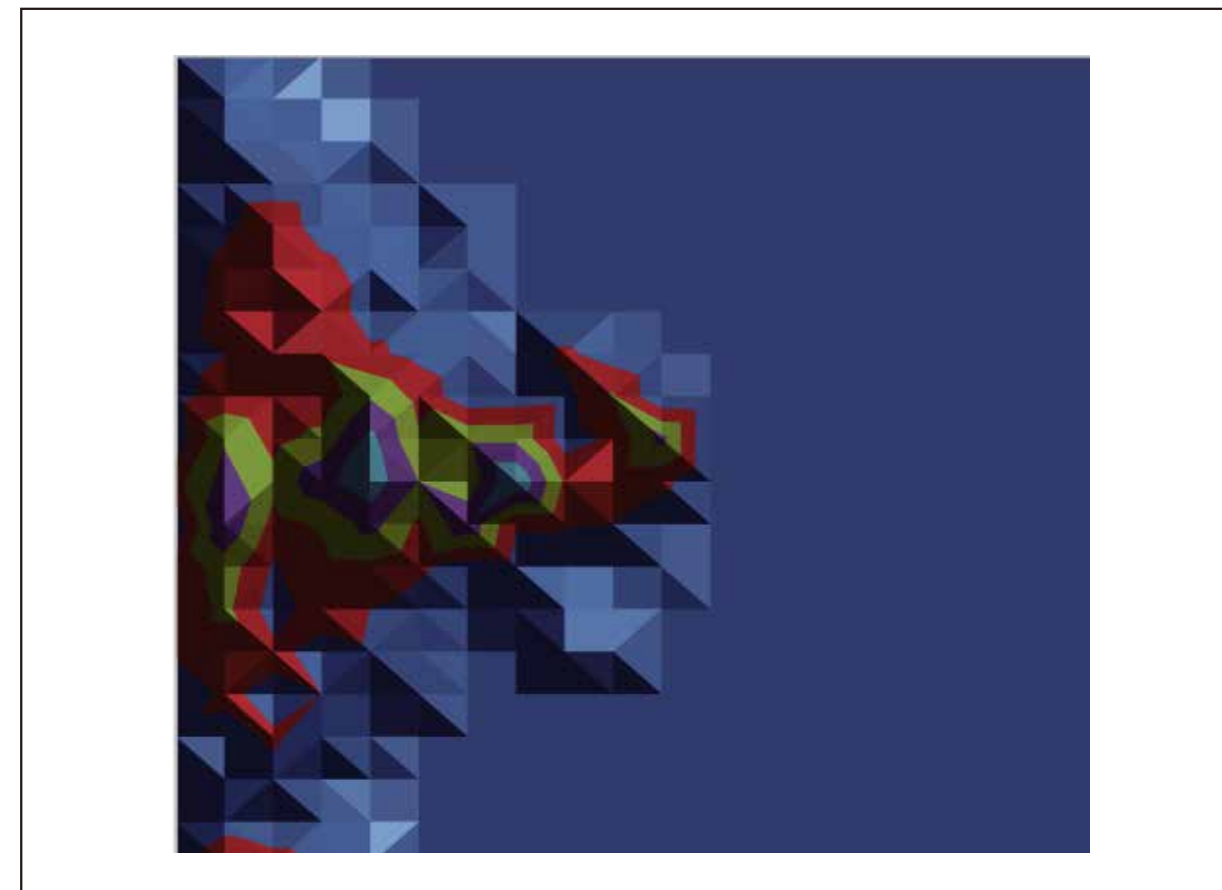
## P-LOSS by WLTC zone



# P-損失解析器

## P-Loss Analyzer

## P-Loss Analyzer



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