**Report on Simulink model**

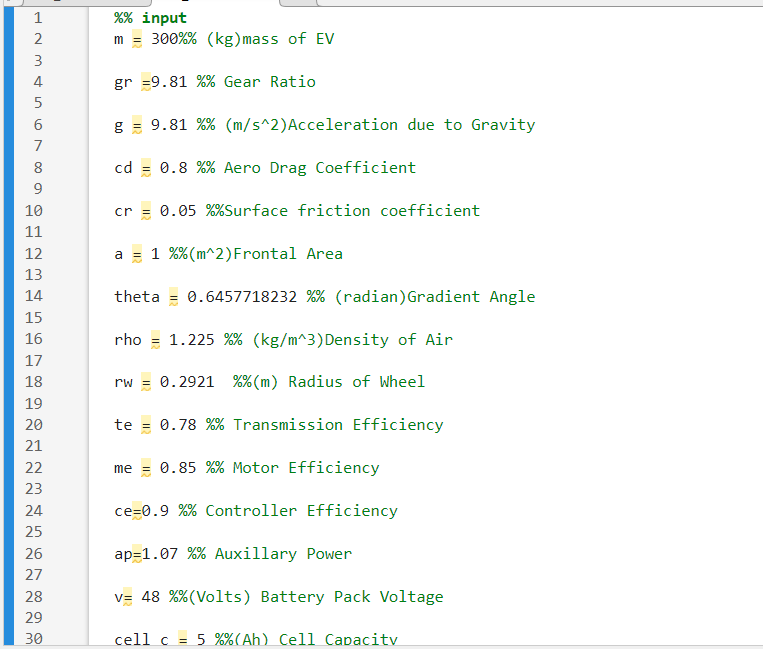
**Objective:** Validation of high voltage system using MATLAB Simulink.

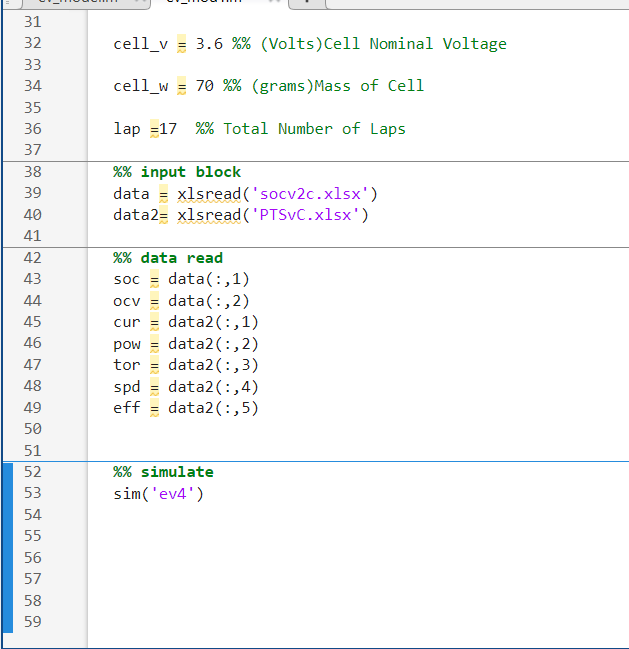
**Target:** To find motor and battery specifications using MATLAB Simulink.

**Input:** Drive cycle (Velocity vs Time).

**Output:** Motor and battery specifications(Power/Torque/RPM vs Time,C rating of cell) according to drive cycle.

MATLAB script for input parameters-

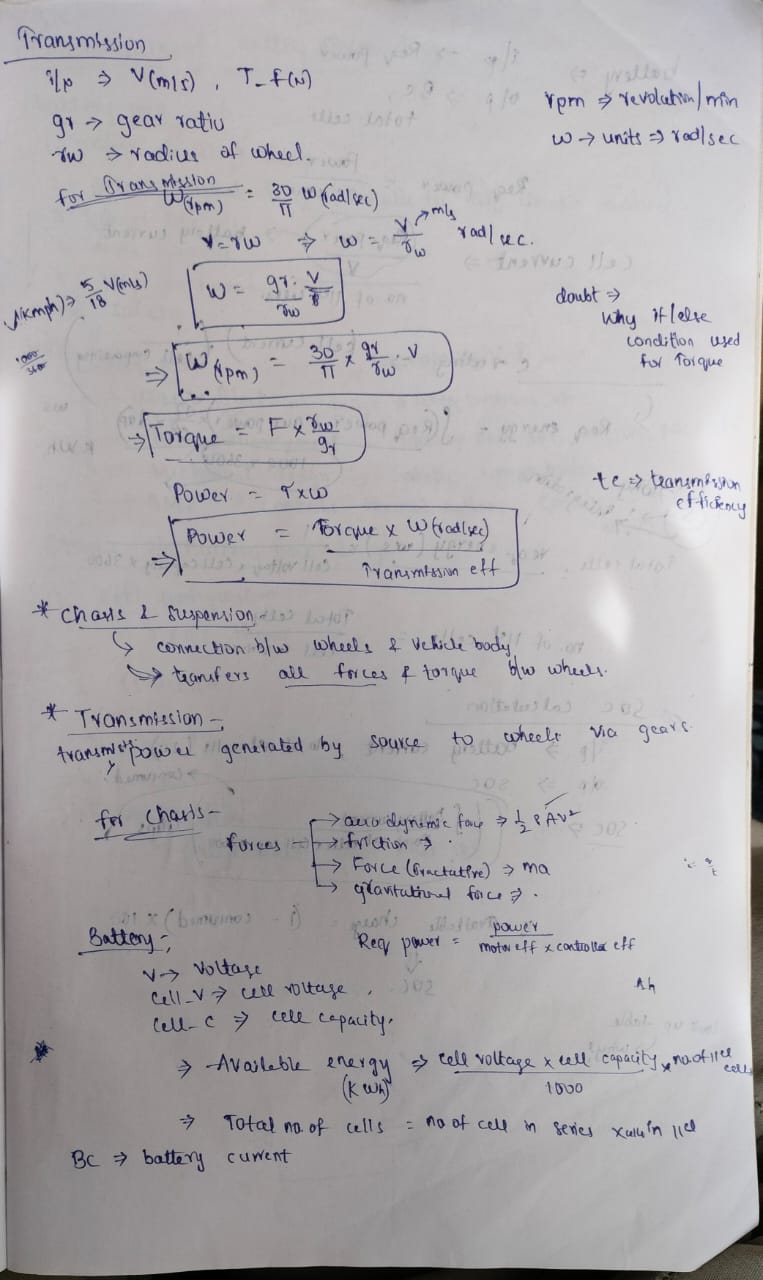
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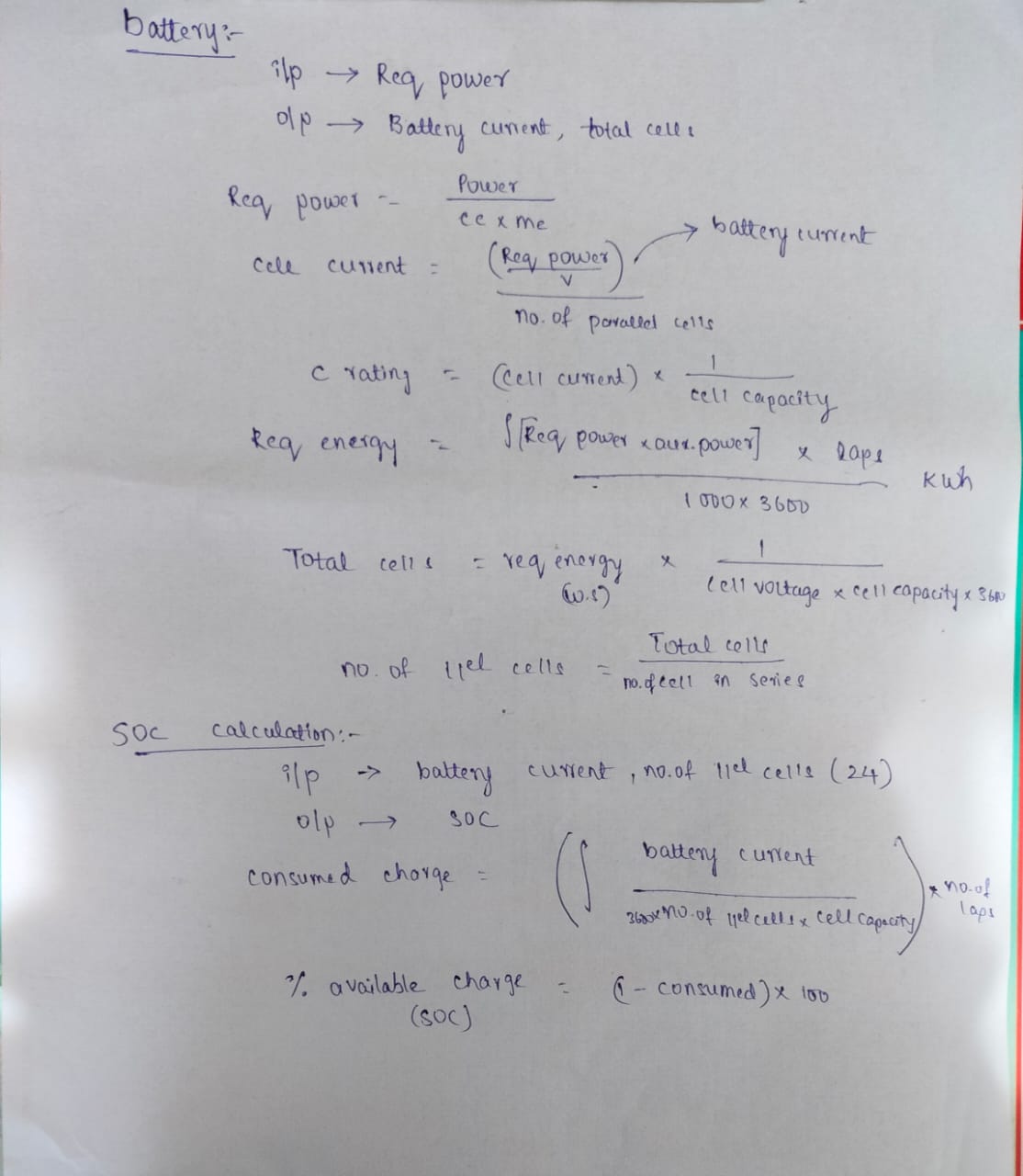
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Motor specification:

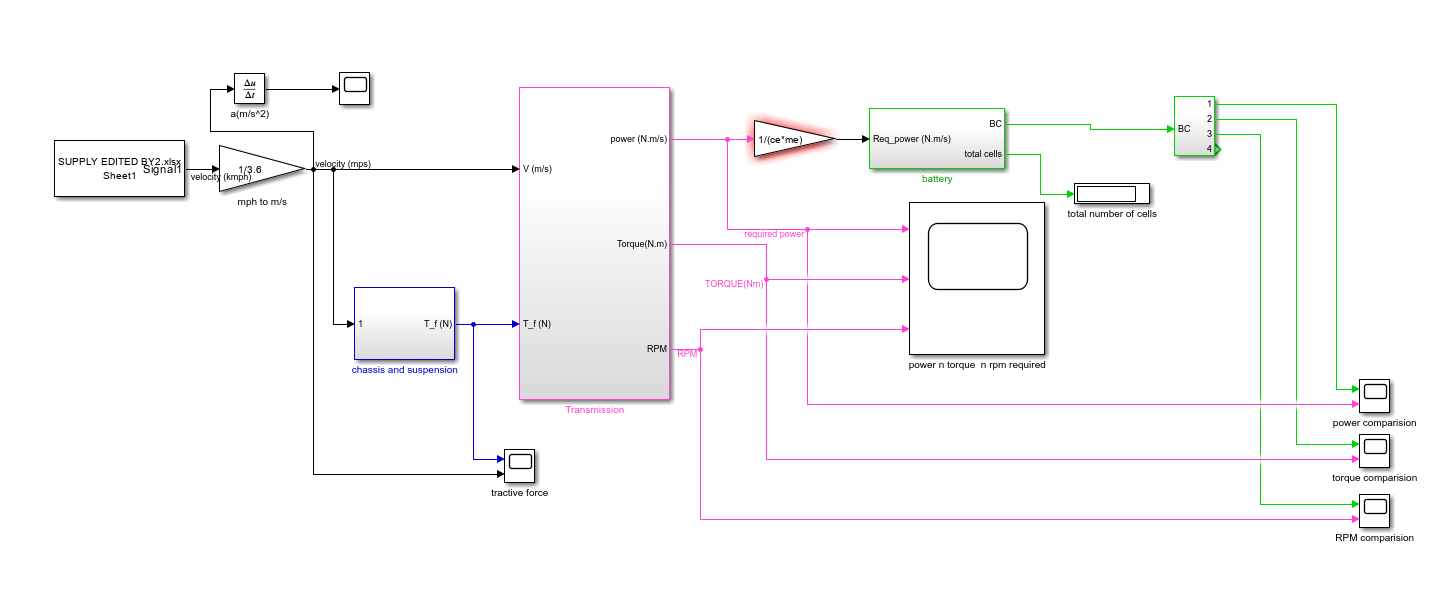
|  |  |
| --- | --- |
| Type | PMSM Motor |
| Power | Peak-7.2 KW  Rated- 5KW |
| Speed | 3900-4500 Rpm |
| Torque | Peak-75 N.m  Rated-25 N.m |

**Formulas used:**

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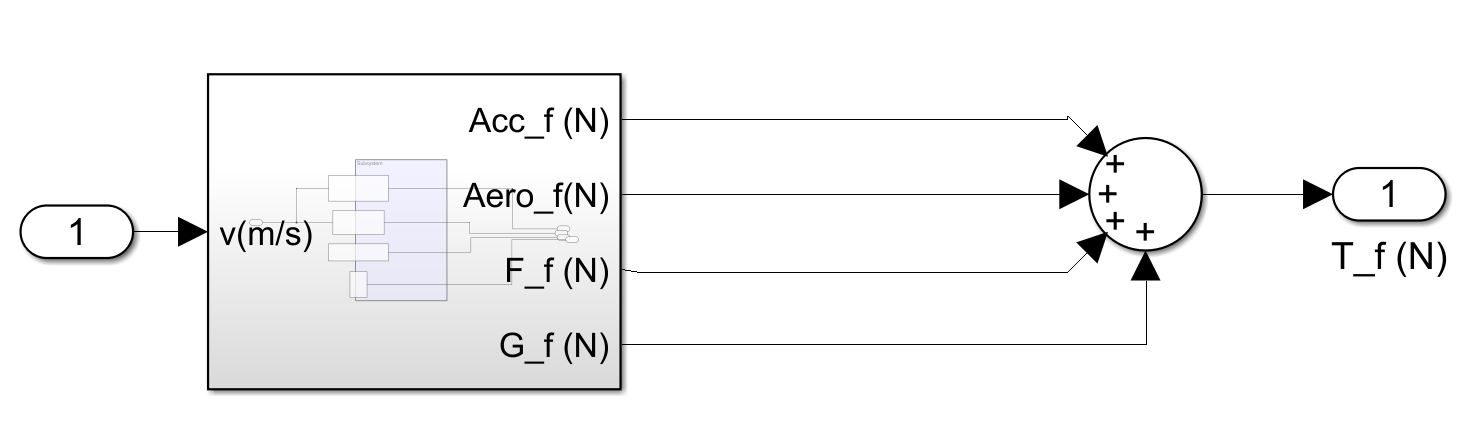
Block diagram:

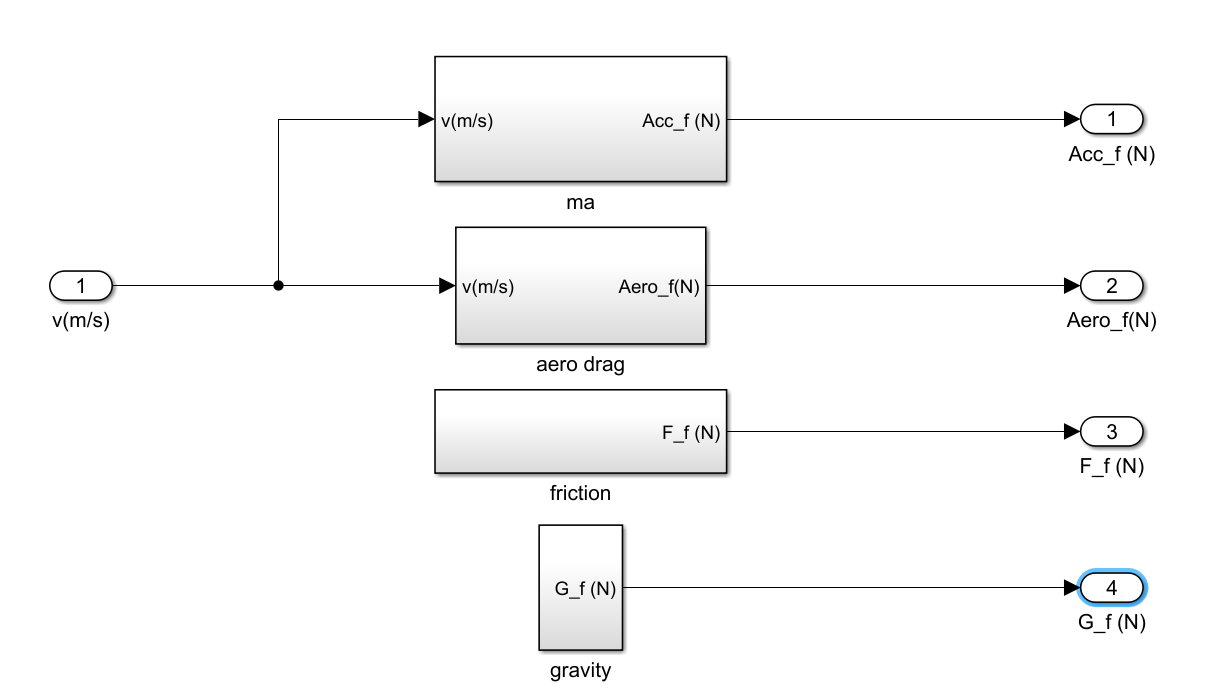


**Chassis and Suspension block:**

**Input:** Drive cycle in m/s.

**Output:** Tractive force(N).

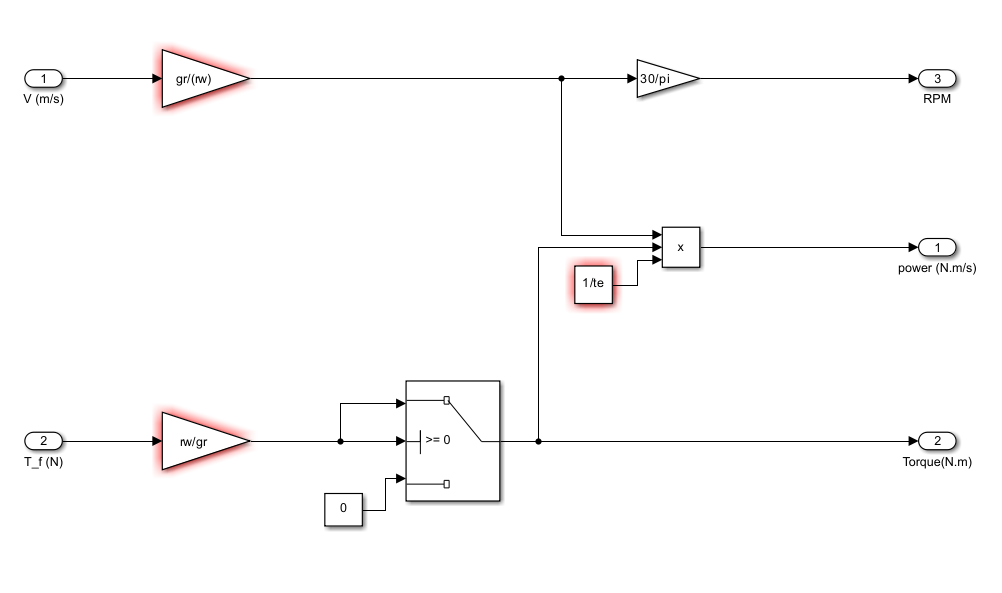




**Transmission block:**

**Input:** Drive cycle(m/s) , Tractive force(N).

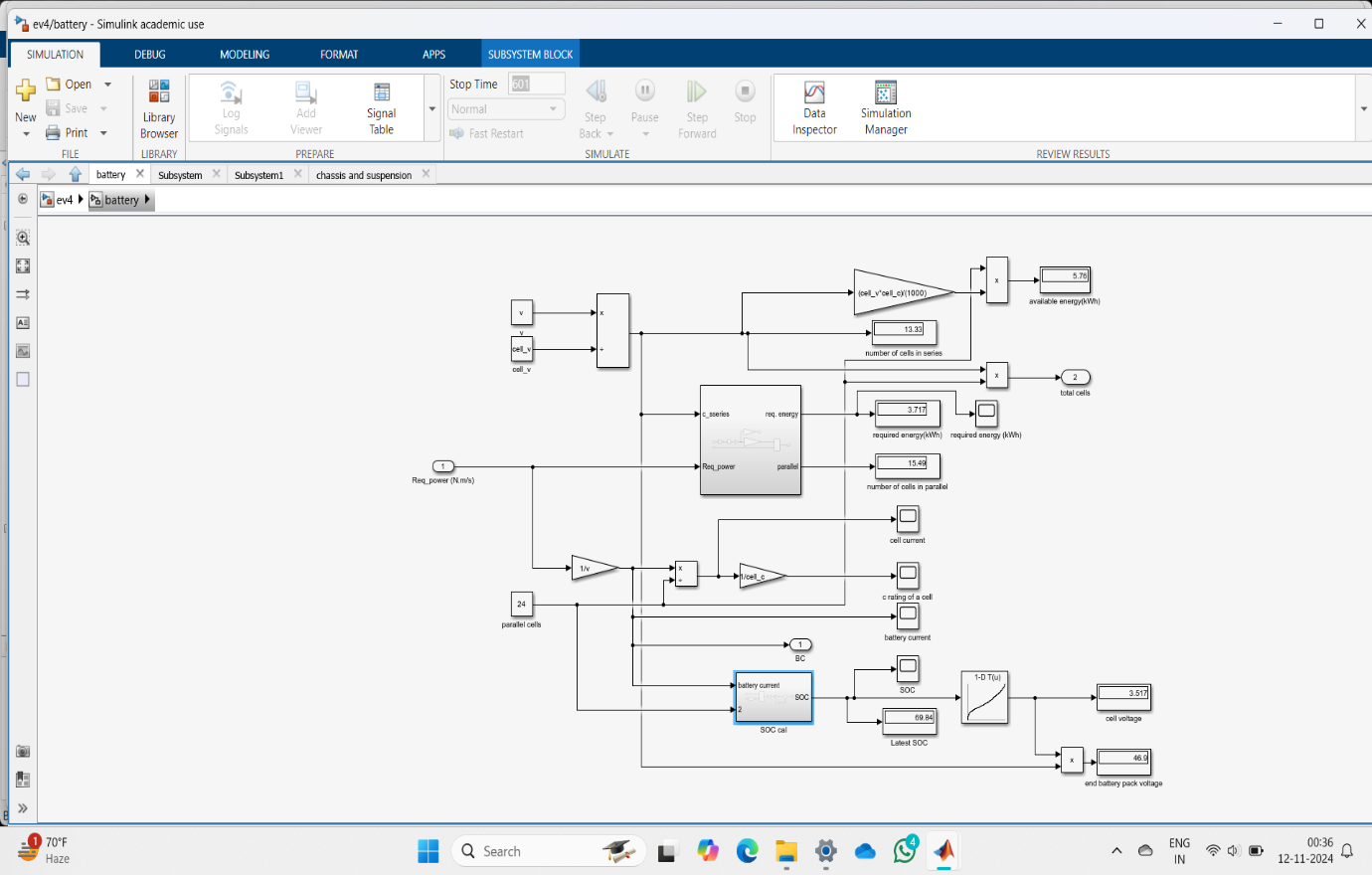
**Output:** Required power,Torque and RPM.

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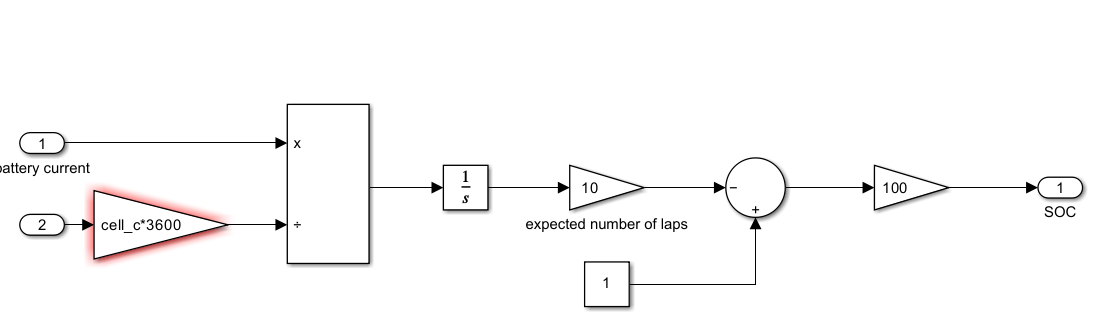
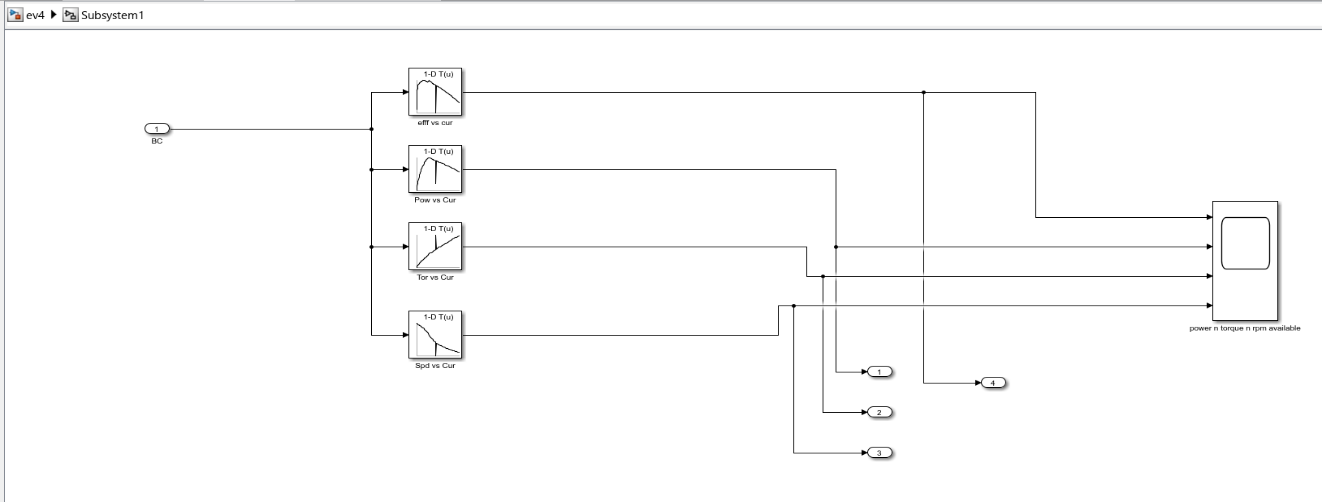
**Battery Block:**

**Input:** Required Power(N.m/s).

**Output:** Battery current and Total cells.

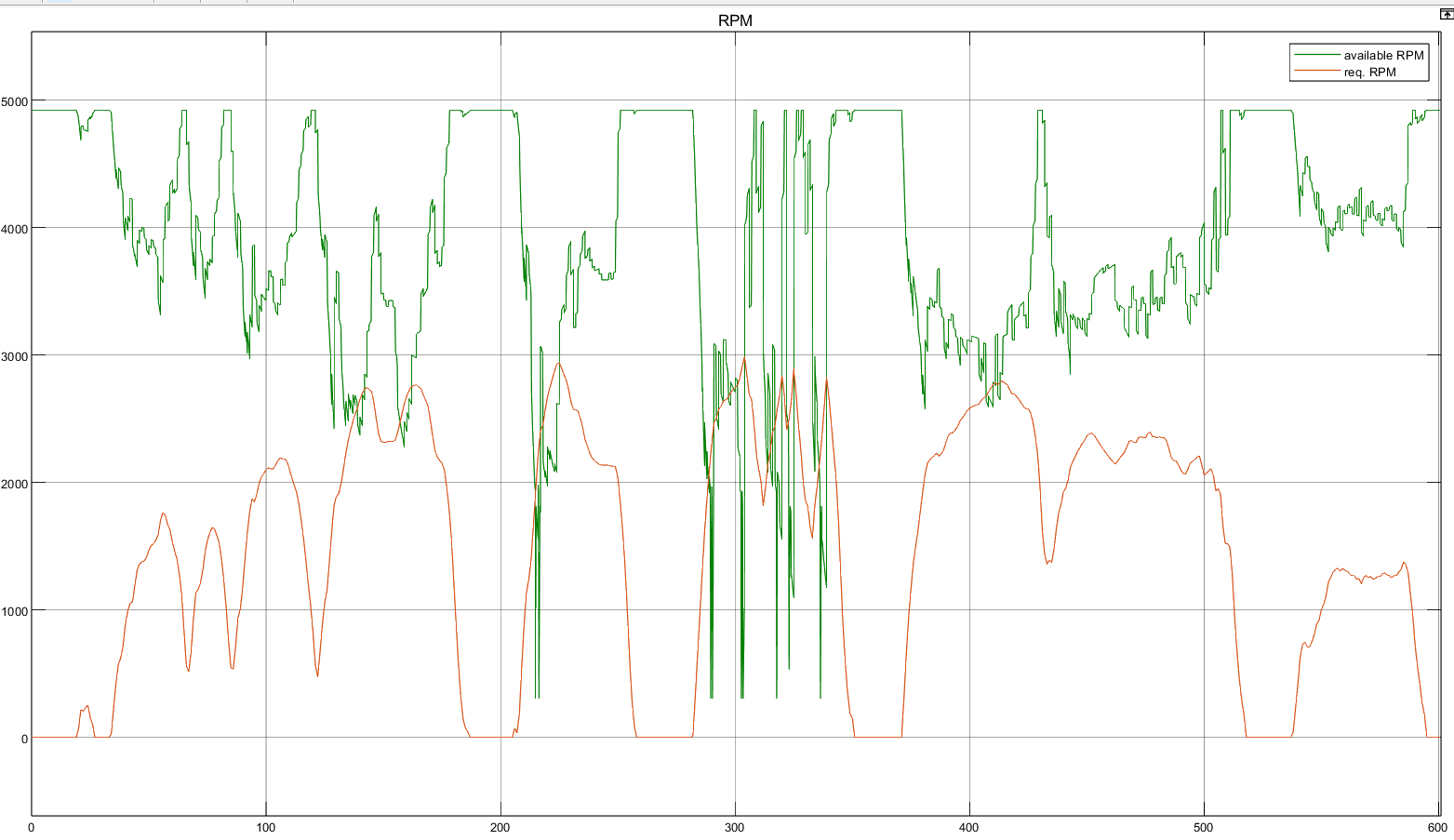


SOC calculation:

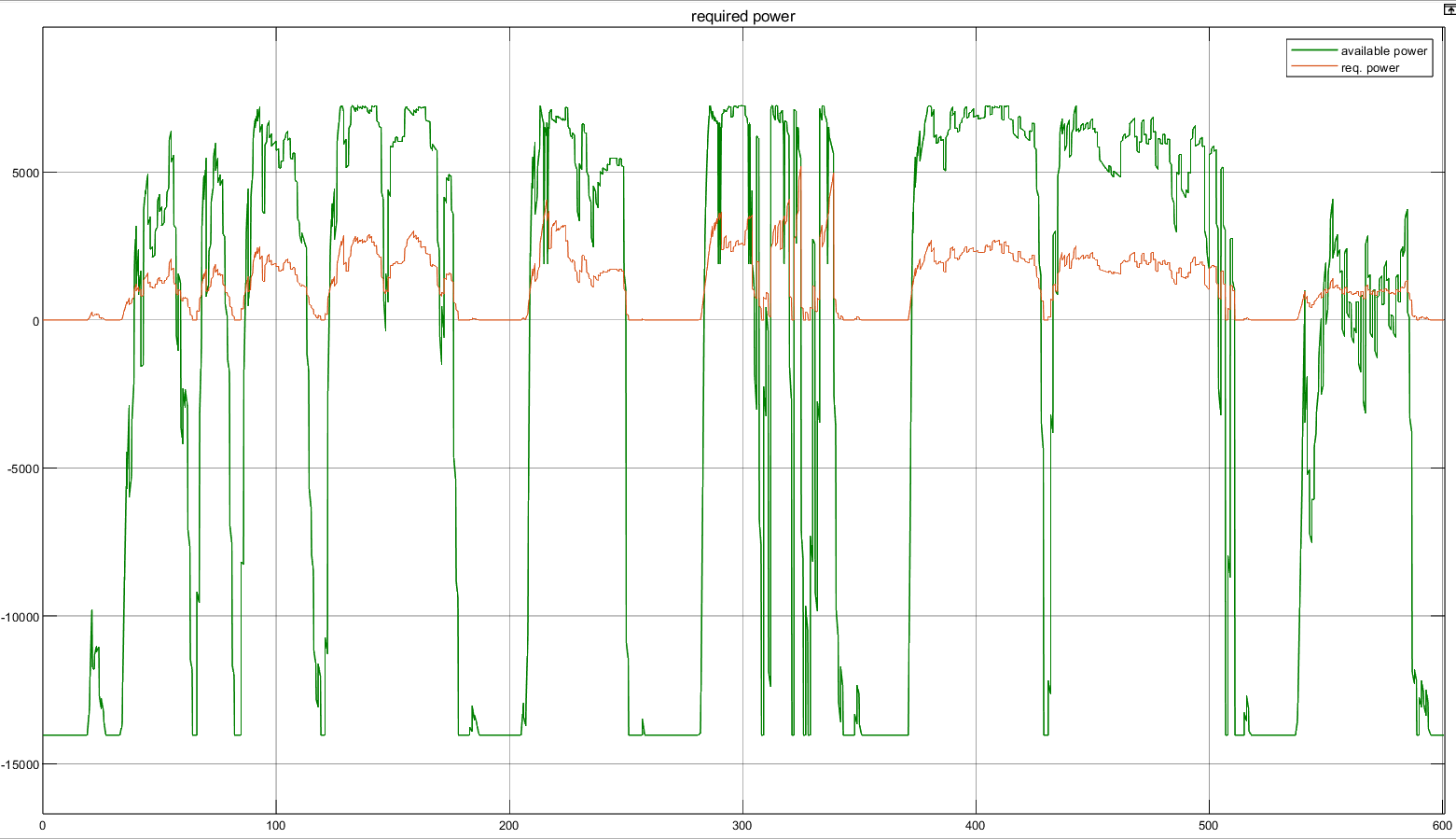
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**Simulation results:**

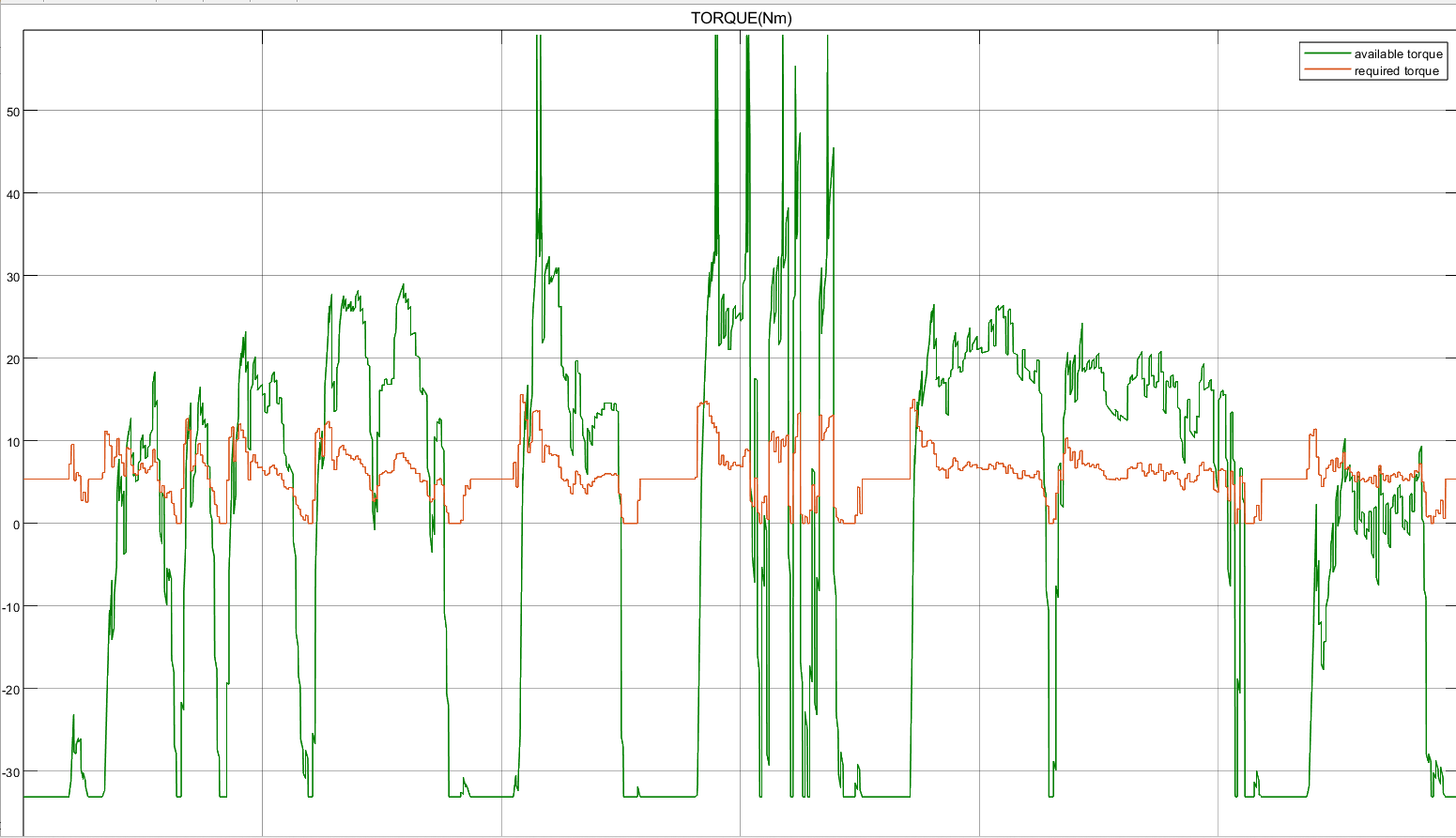
1.RPM comparison (available vs required):



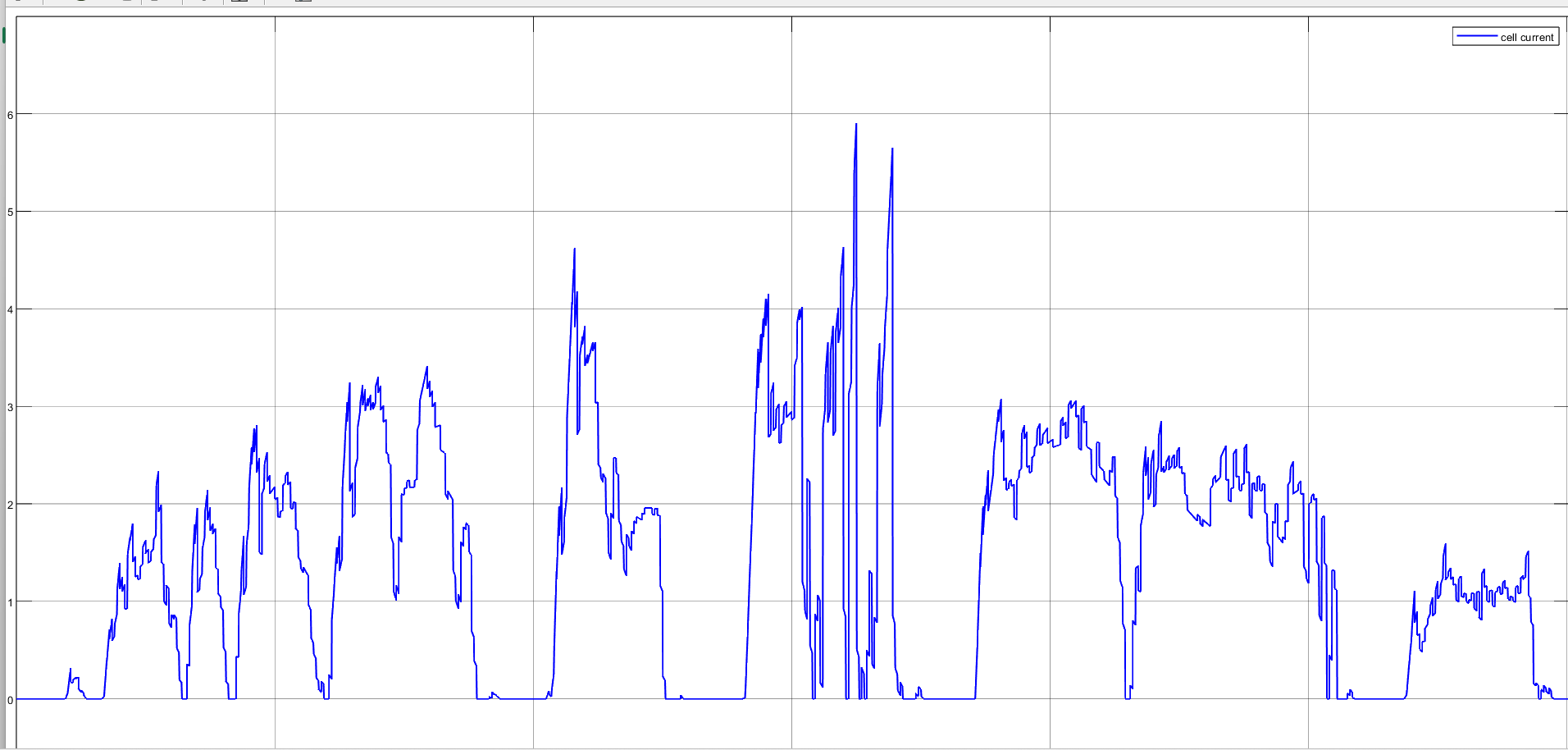
2. Power comparison:



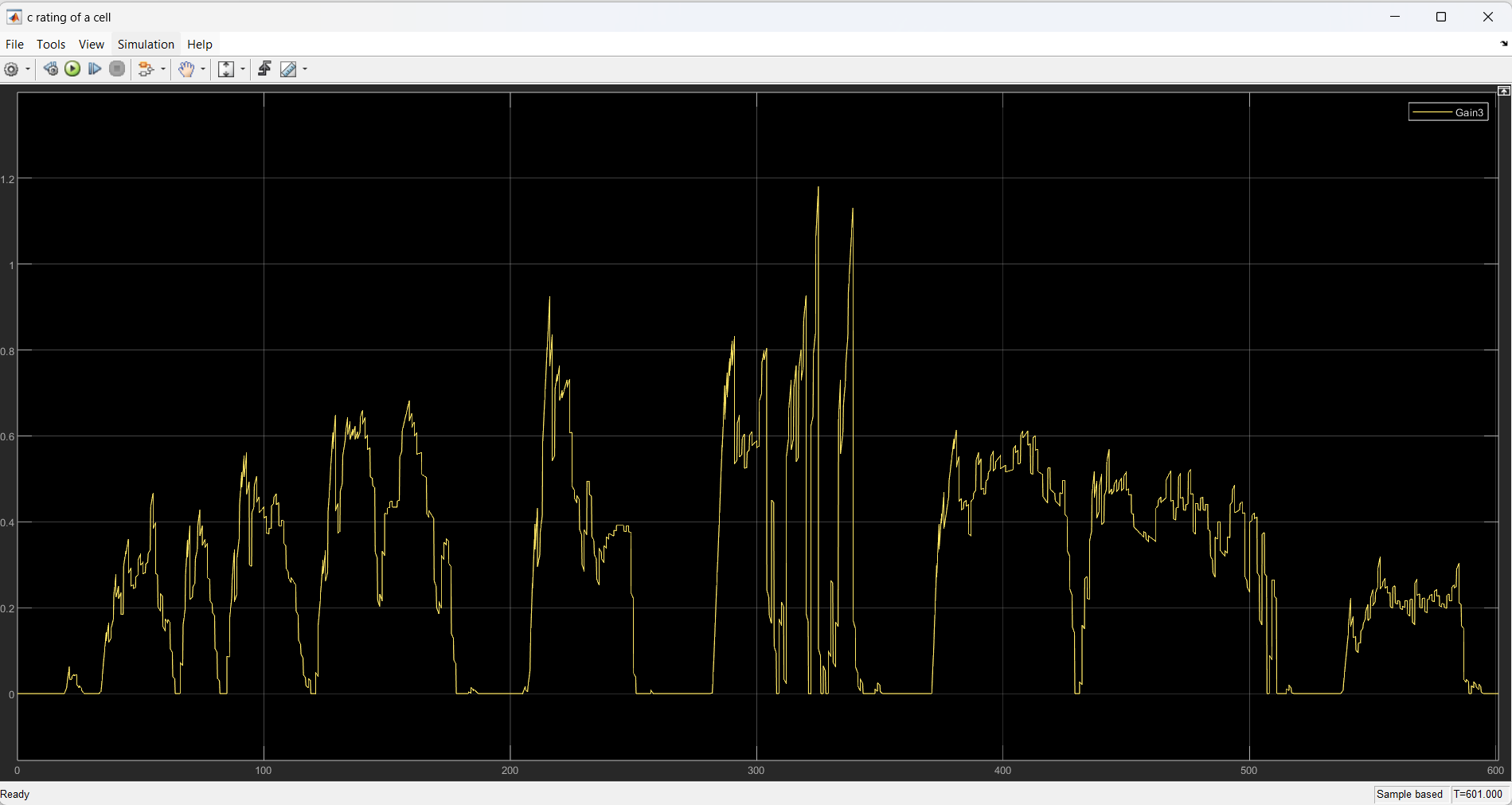
3.Torque comparison:



4.Cell current:



5.C rate:



6.Chassis and Suspension:

Tractive force & Velocity vs Time-

