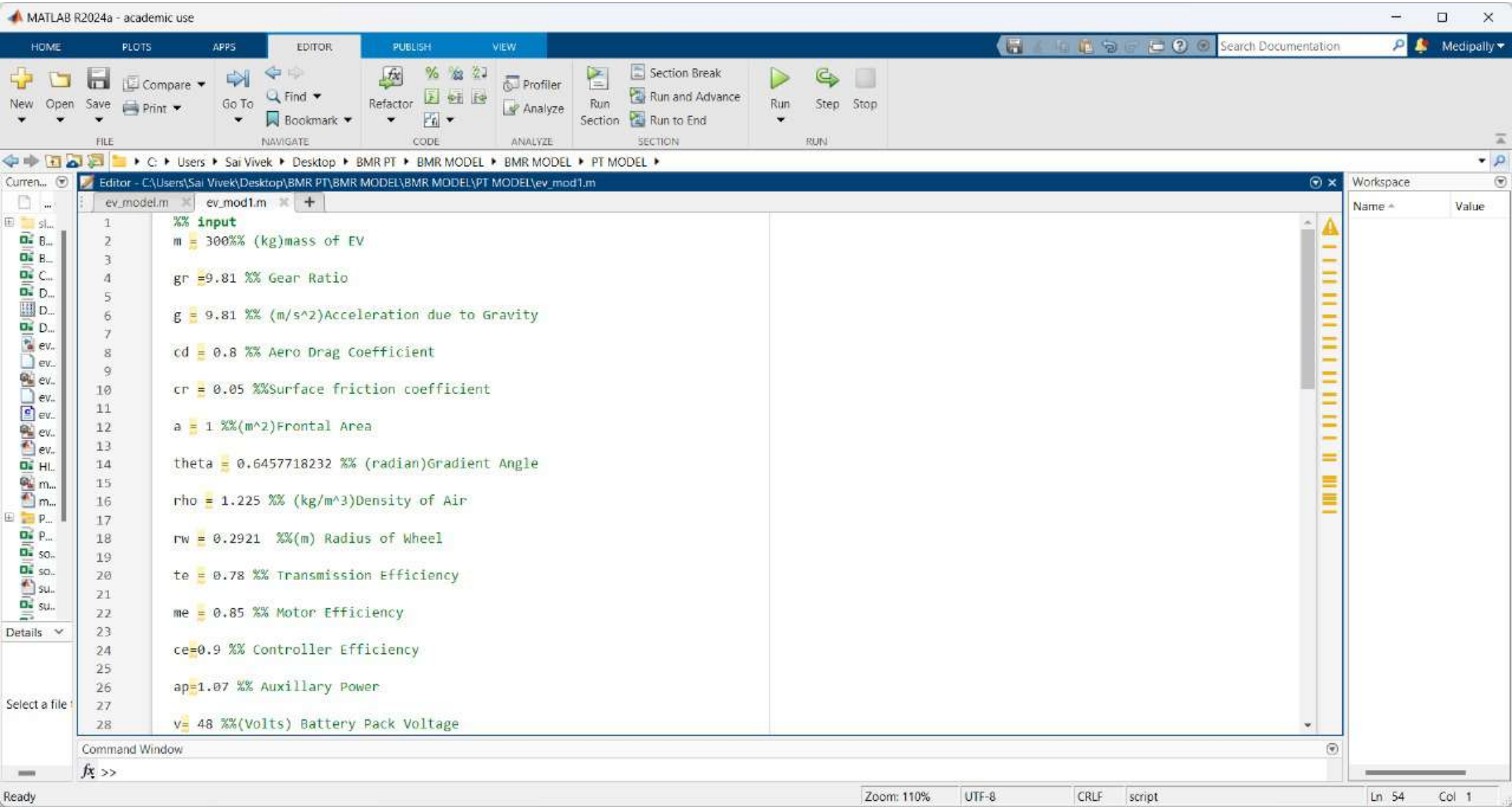
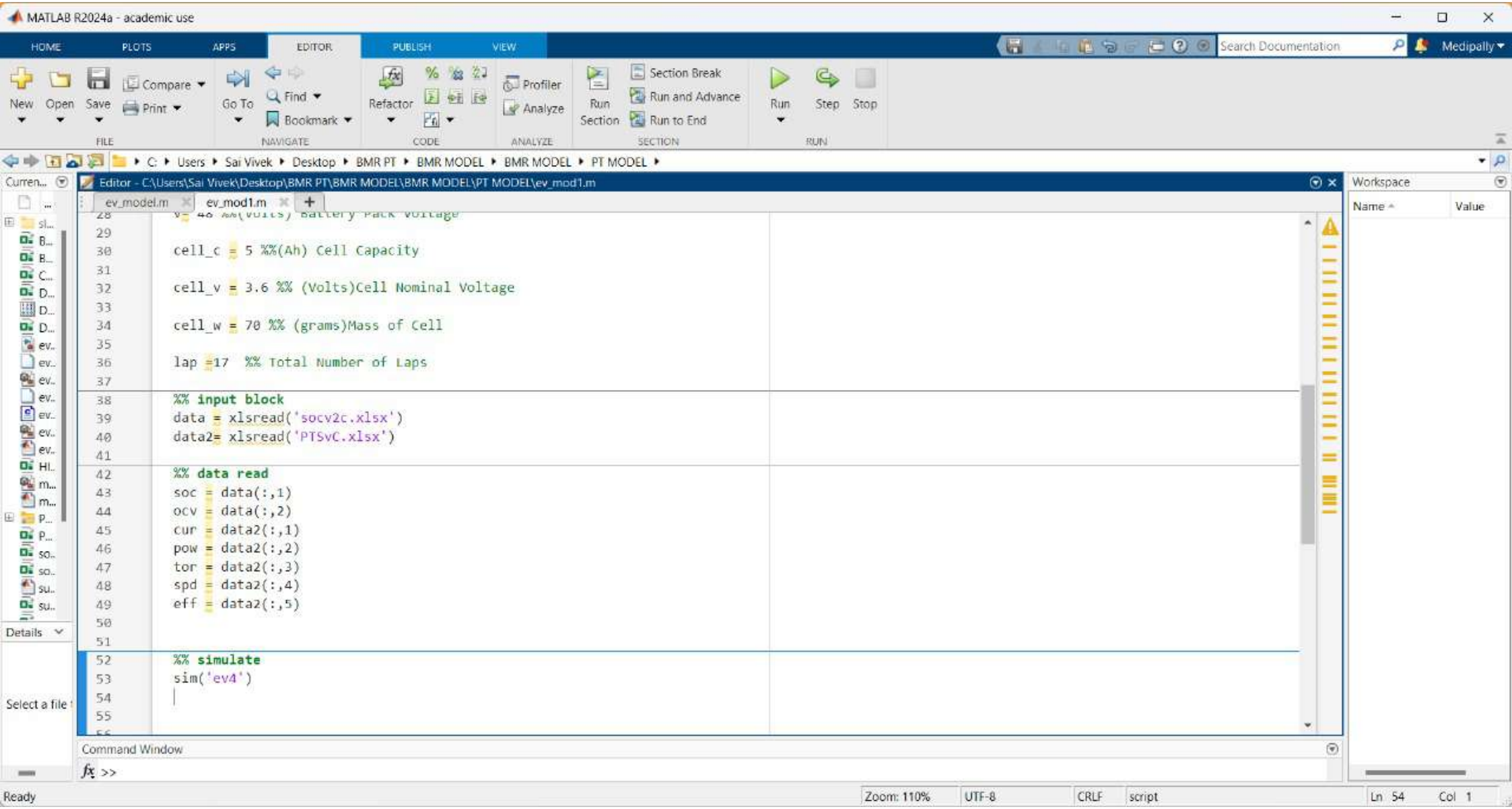

MATLAB R2024a - academic use
HOME
PLOTS
APPS
EDITOR
PUBLISH
VIEW
Search Documentation
Medipally
New
Open
Save
Compare
Print
FILE
Go To
Find
Bookmark
NAVIGATE
Refactor
CODE
Profiler
Analyze
ANALYZE
Run Section
Section Break
Run and Advance
Run to End
SECTION
Run
Step
Stop
RUN
C: ▸ Users ▸ Sai Vivek ▸ Desktop ▸ BMR PT ▸ BMR MODEL ▸ BMR MODEL ▸ PT MODEL ▸
Editor - C:\Users\Sai Vivek\Desktop\BMR PT\BMR MODEL\BMR MODEL\PT MODEL\ev_mod1.m
ev_model.m
ev_mod1.m
1 %% input
2 m = 300%% (kg)mass of EV
3
4 gr =9.81 %% Gear Ratio
5
6 g = 9.81 %% (m/s^2)Acceleration due to Gravity
7
8 cd = 0.8 %% Aero Drag Coefficient
9
10 cr = 0.05 %%Surface friction coefficient
11
12 a = 1 %%(m^2)Frontal Area
13
14 theta = 0.6457718232 %% (radian)Gradient Angle
15
16 rho = 1.225 %% (kg/m^3)Density of Air
17
18 rw = 0.2921 %%(m) Radius of Wheel
19
20 te = 0.78 %% Transmission Efficiency
21
22 me = 0.85 %% Motor Efficiency
23
24 ce=0.9 %% Controller Efficiency
25
26 ap=1.07 %% Auxillary Power
27
28 v= 48 %%(Volts) Battery Pack Voltage
Workspace
Name
Value
Command Window
>>
Ready
Zoom: 110%
UTF-8
CRLF
script
Ln 54
Col 1


MATLAB R2024a - academic use
HOME
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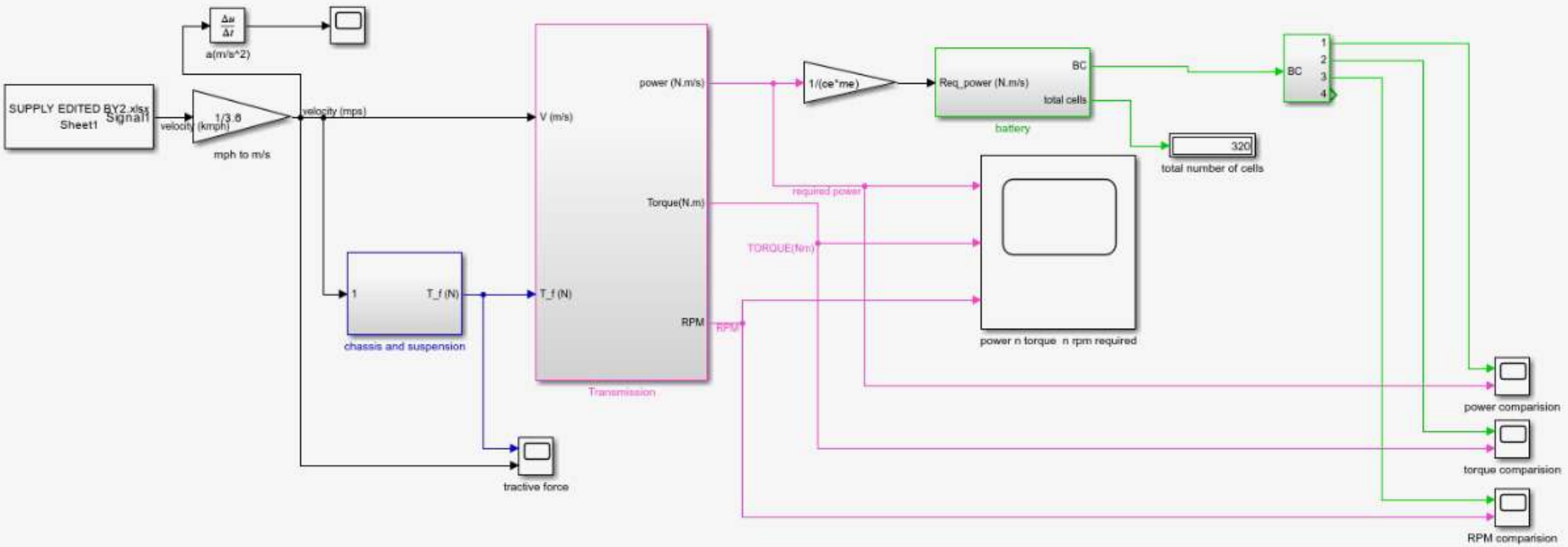
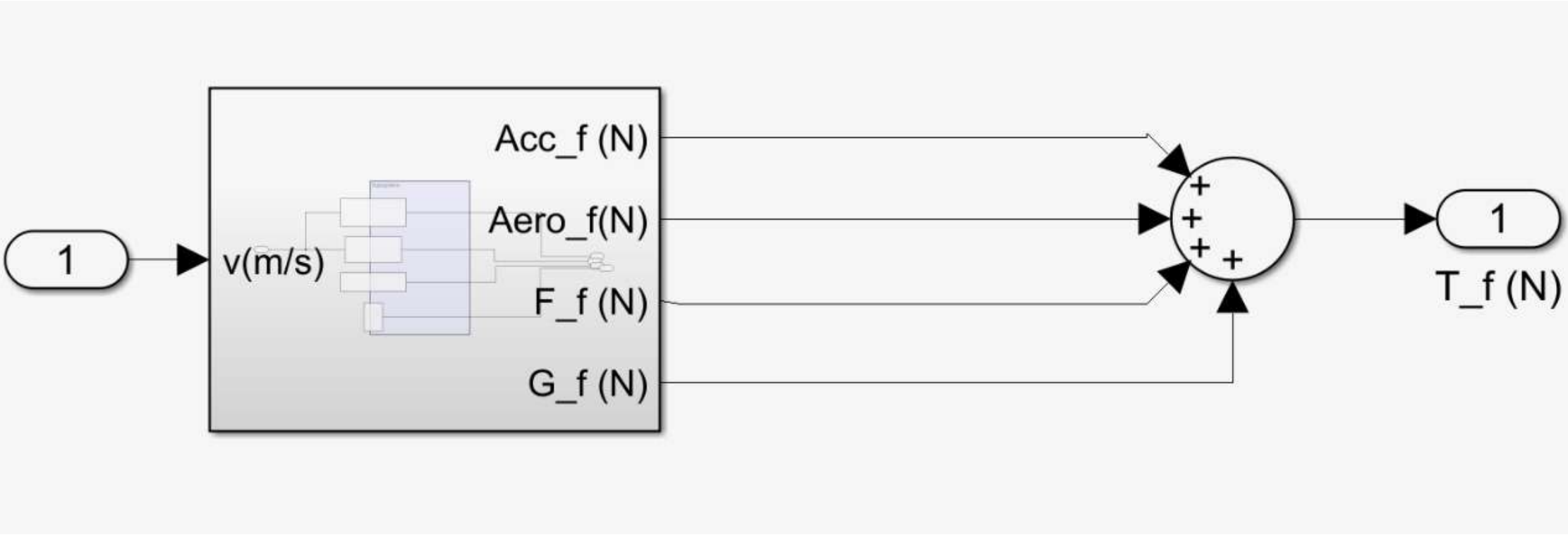
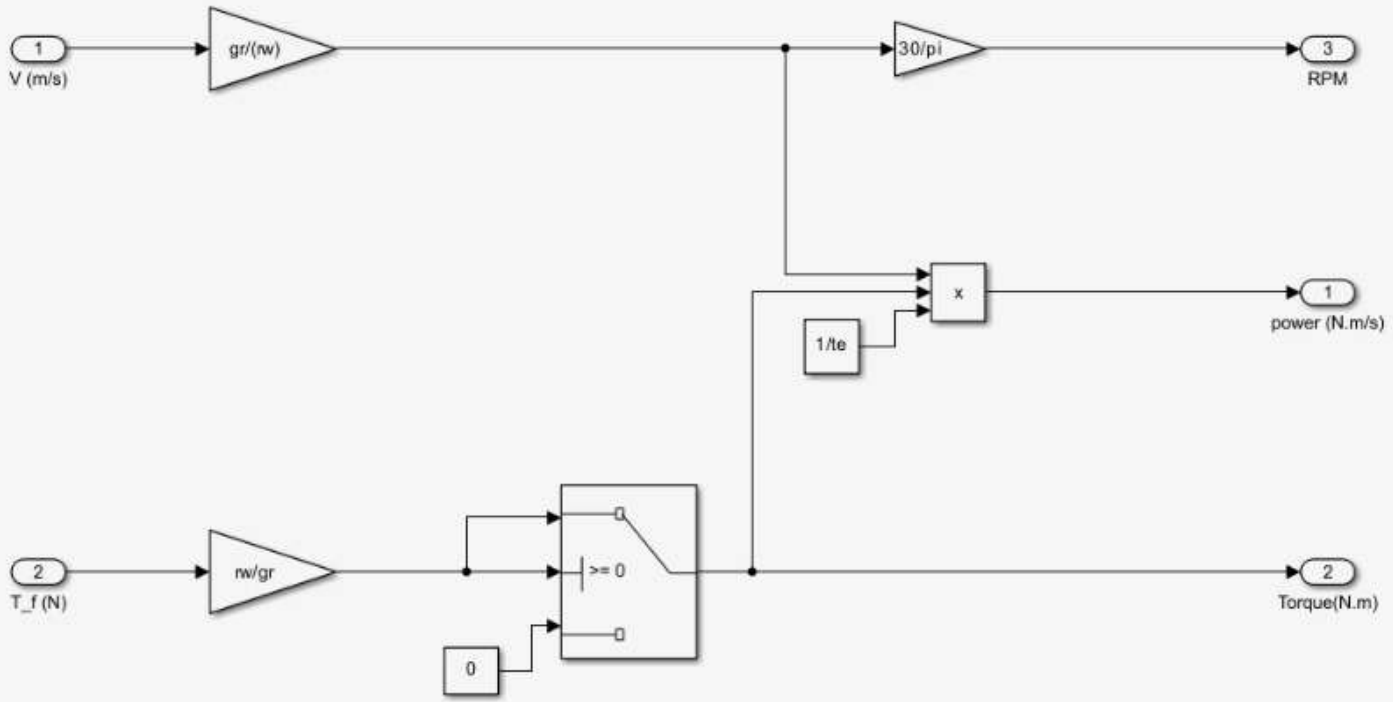
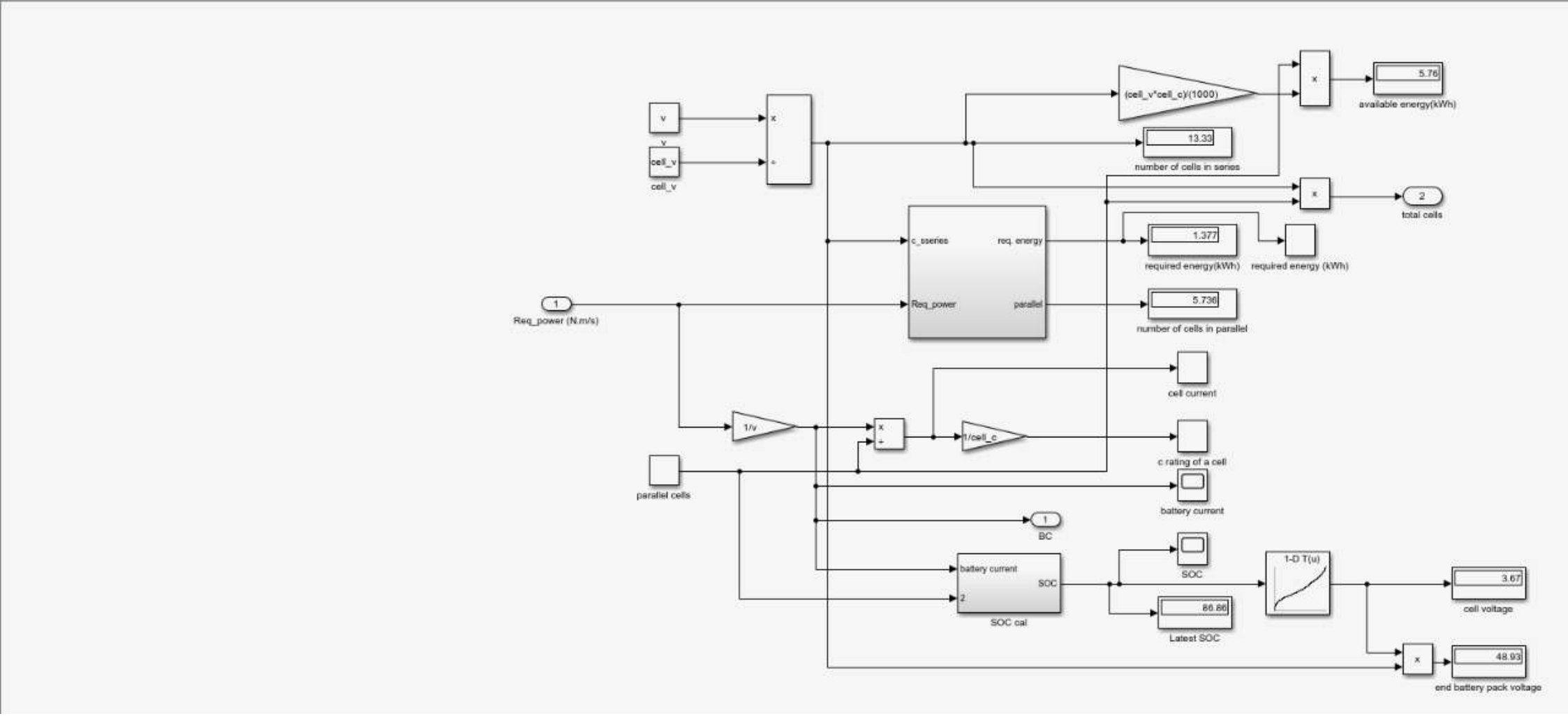
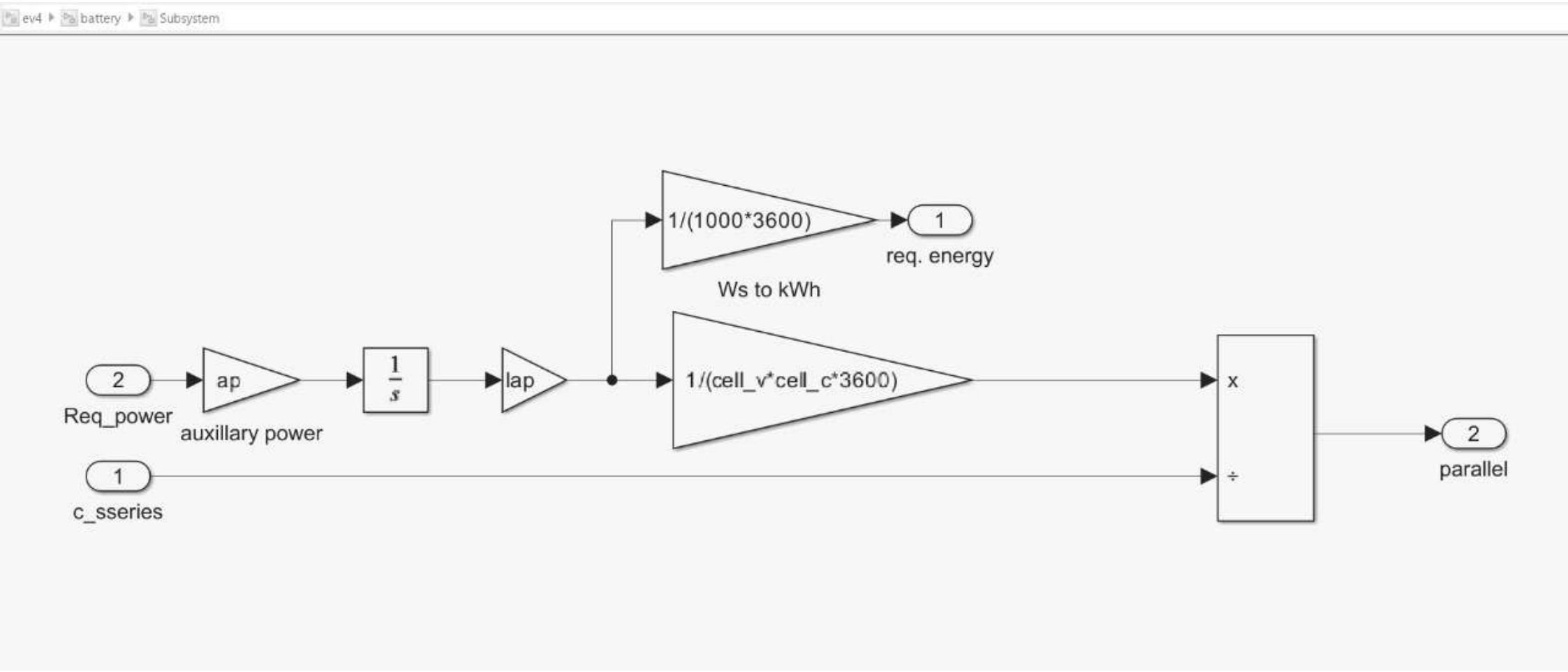
Stop
RUN
C: ▸ Users ▸ Sai Vivek ▸ Desktop ▸ BMR PT ▸ BMR MODEL ▸ BMR MODEL ▸ PT MODEL ▸
Editor - C:\Users\Sai Vivek\Desktop\BMR PT\BMR MODEL\BMR MODEL\PT MODEL\ev_mod1.m
ev_model.m
ev_mod1.m
Workspace
Name
Value
cell_c = 5 %%(Ah) Cell Capacity
cell_v = 3.6 %% (Volts)Cell Nominal Voltage
cell_w = 70 %% (grams)Mass of Cell
lap =17 %% Total Number of Laps
%% input block
data = xlsread('socv2c.xlsx')
data2= xlsread('PTSvC.xlsx')
%% data read
soc = data(:,1)
ocv = data(:,2)
cur = data2(:,1)
pow = data2(:,2)
tor = data2(:,3)
spd = data2(:,4)
eff = data2(:,5)
%% simulate
sim('ev4')
Command Window
>>
Details
Select a file
Ready
Zoom: 110%
UTF-8
CRLF
script
Ln 54
Col 1


SUPPLY EDITED BY2.xlsx
Sheet1
Signal1
velocity (kmph)
1/3.6
mph to m/s
velocity (mps)
Δv/Δt
a(m/s^2)
V (m/s)
power (N.m/s)
Torque(N.m)
RPM
Transmission
1/(ce*me)
Req_power (N.m/s)
BC
total cells
battery
320
total number of cells
BC
1
2
3
4
required power
TORQUE(Nm)
RPM
power n torque n rpm required
1
T_f (N)
chassis and suspension
T_f (N)
tractive force
power comparision
torque comparision
RPM comparision

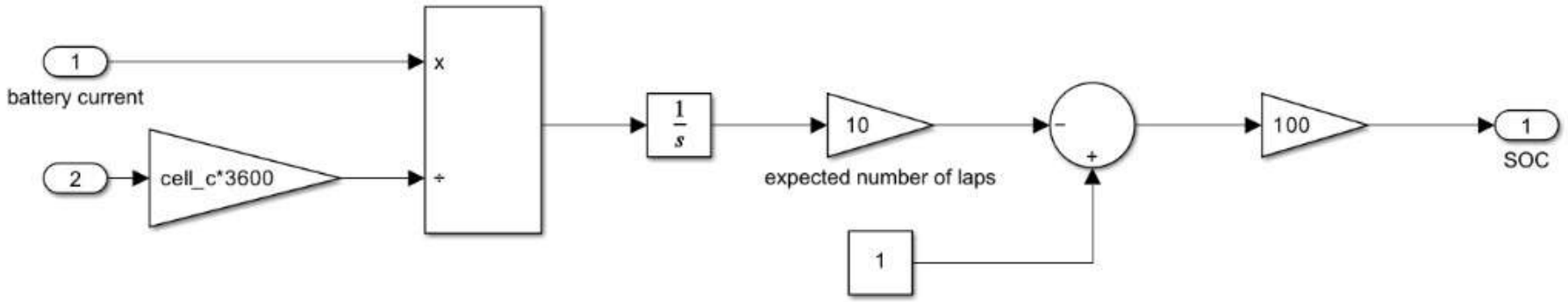

1
v(m/s)
Acc_f (N)
Aero_f(N)
F_f (N)
G_f (N)
+
+
+
+
1
T_f (N)

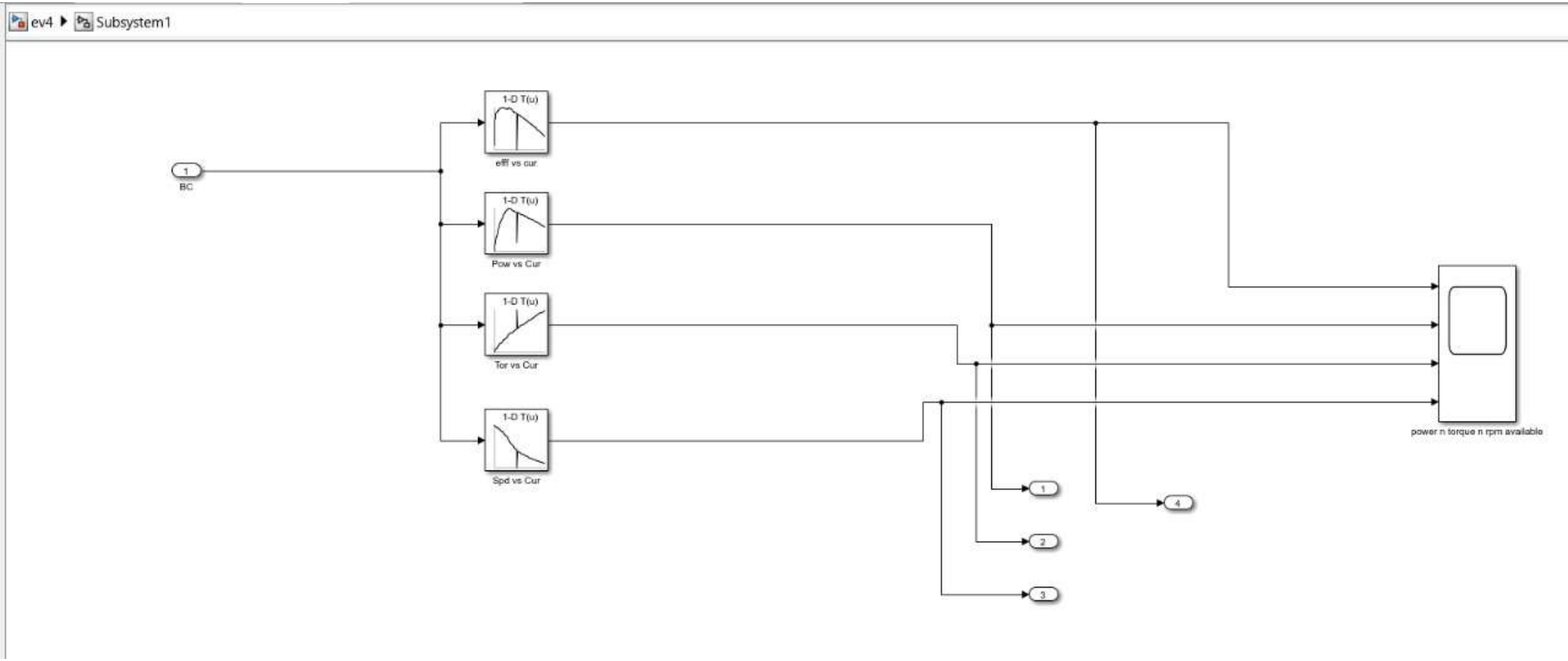

1
V (m/s)
gr/(rw)
30/pi
3
RPM
x
1
power (N.m/s)
1/te
2
T_f (N)
rw/gr
>= 0
0
2
Torque(N.m)

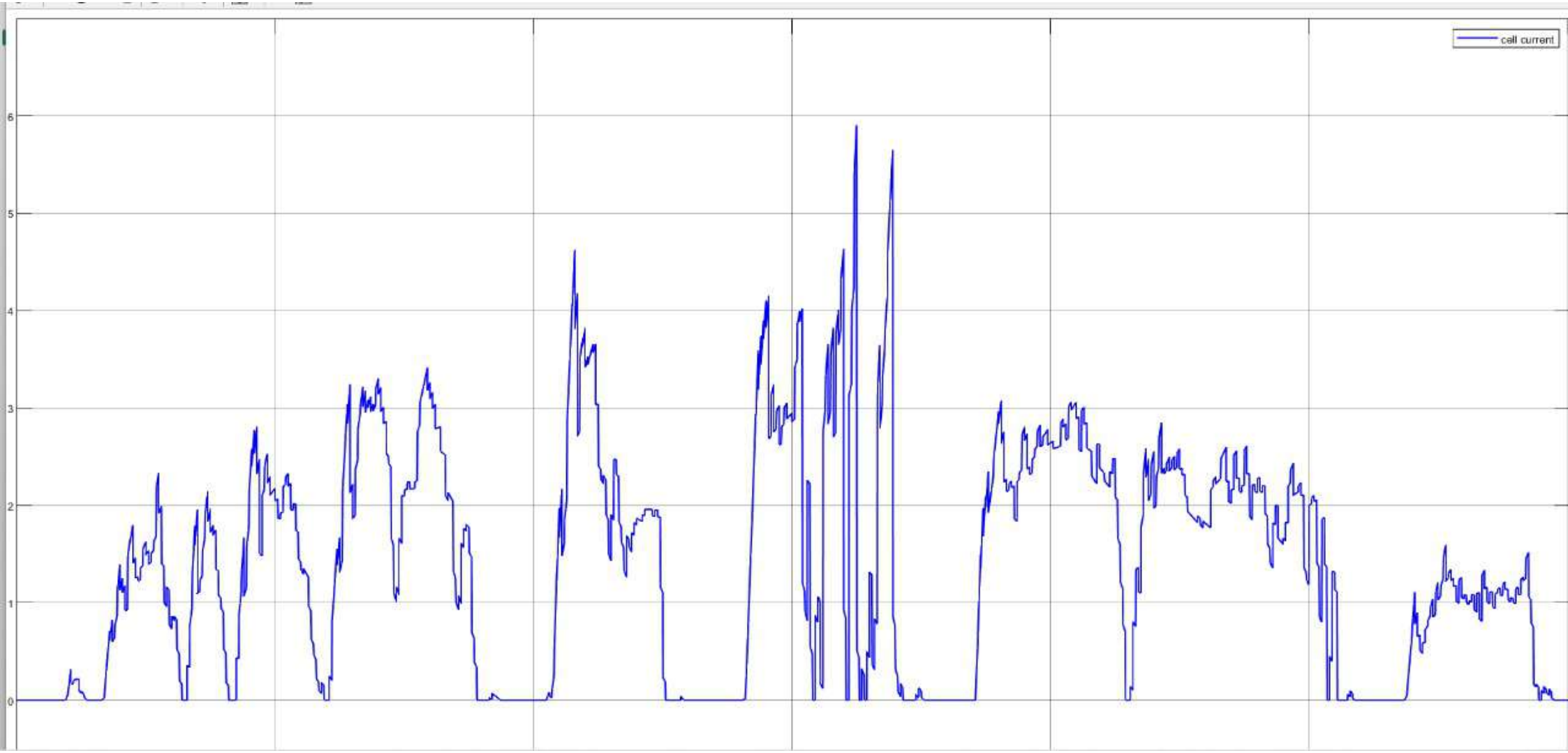

v
v
cell_v
cell_v
x
÷
(cell_v*cell_c)/(1000)
x
5.76
available energy(kWh)
13.33
number of cells in series
x
2
total cells
c_series
req. energy
Req_power
parallel
1.377
required energy(kWh)
required energy (kWh)
5.736
number of cells in parallel
1
Req_power (N.m/s)
cell current
1/v
x
÷
1/cell_c
c rating of a cell
parallel cells
battery current
1
BC
battery current
SOC
2
SOC cal
SOC
1-D T(u)
3.67
cell voltage
86.86
Latest SOC
x
48.93
end battery pack voltage

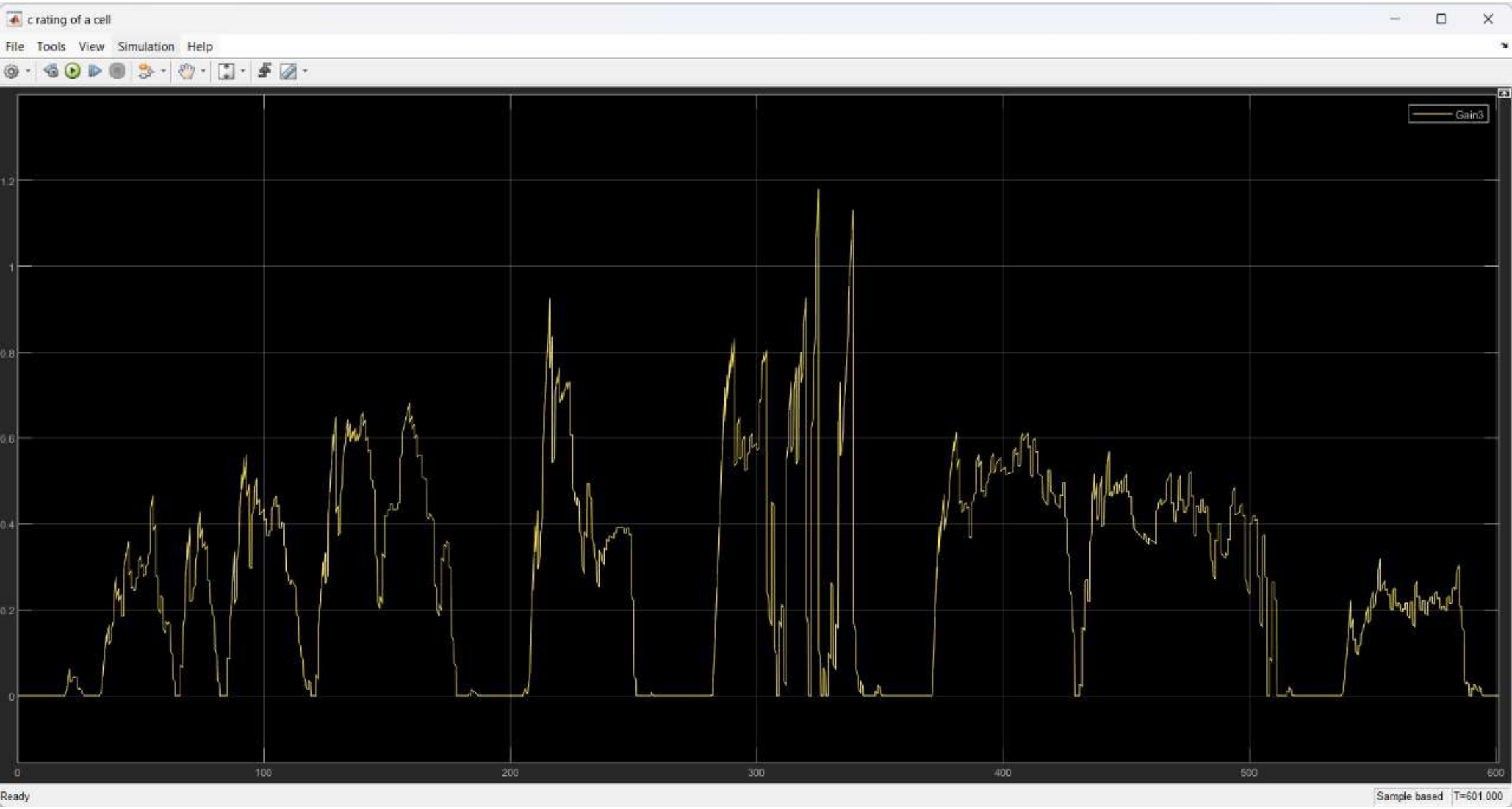

ev4
battery
Subsystem
1/(1000*3600)
1
req. energy
Ws to kWh
2
Req_power
ap
auxillary power
1
s
lap
1/(cell_v*cell_c*3600)
x
÷
2
parallel
1
c_sseries

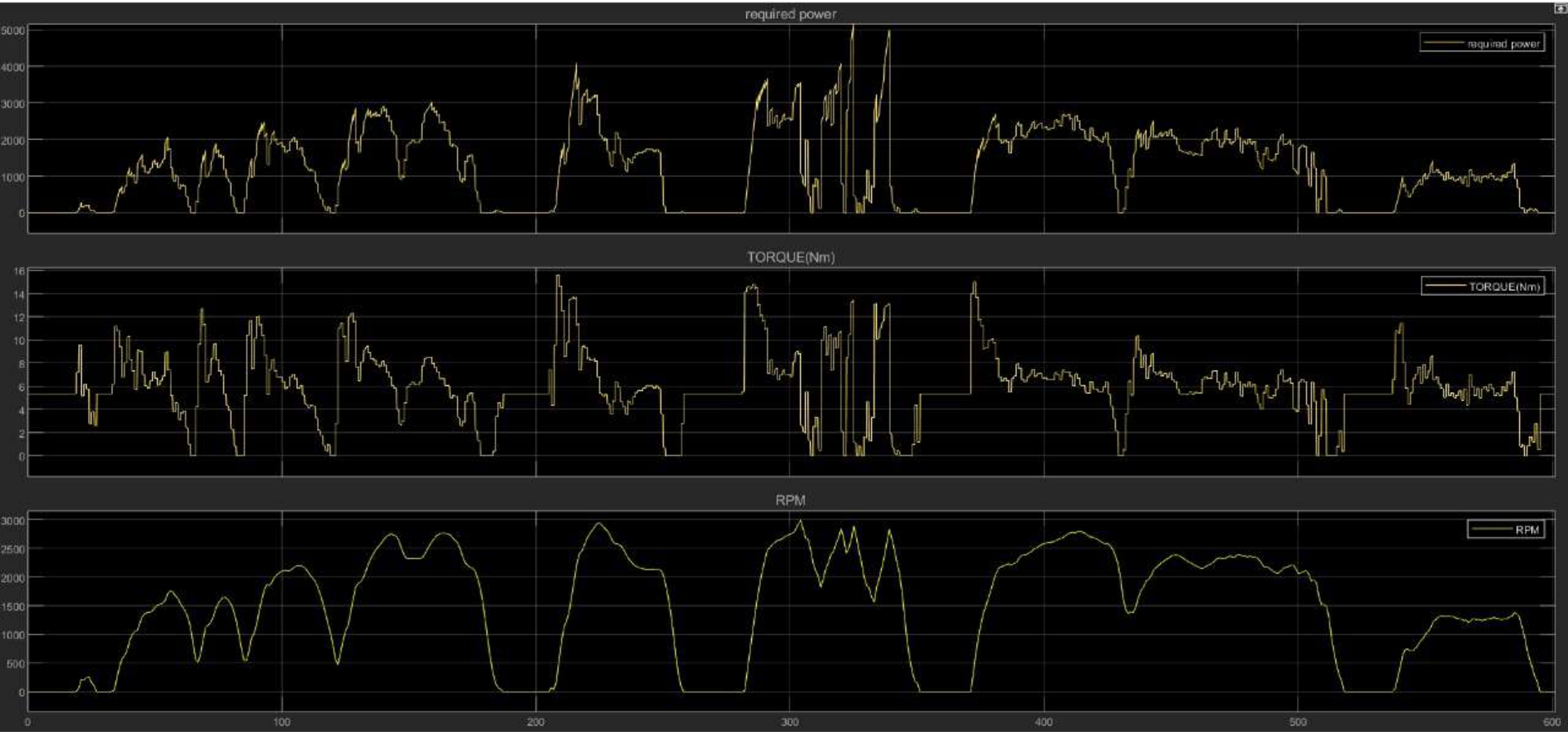
ev4 ▸ battery ▸ SOC cal

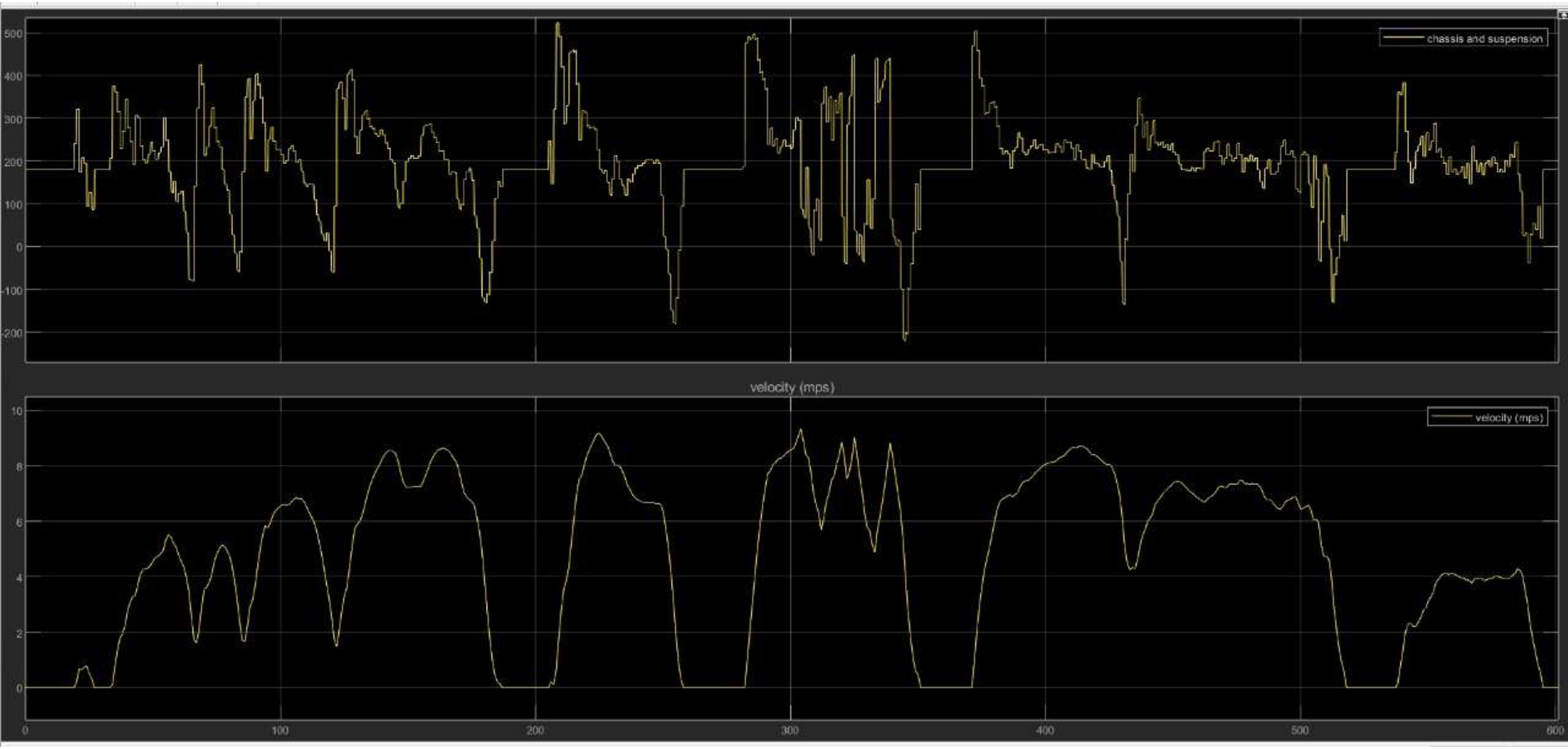



ev4
Subsystem1
1
BC
1-D T(u)
eff vs cur
1-D T(u)
Pow vs Cur
1-D T(u)
Tor vs Cur
1-D T(u)
Spd vs Cur
power n torque n rpm available
1
2
3
4


cell current
6
5
4
3
2
1
0


c rating of a cell
File Tools View Simulation Help
Gain3
1.2
1
0.8
0.6
0.4
0.2
0
0 100 200 300 400 500 600
Ready
Sample based T=601.000


required power
required power
5000
4000
3000
2000
1000
0
TORQUE(Nm)
TORQUE(Nm)
16
14
12
10
8
6
4
2
0
RPM
RPM
3000
2500
2000
1500
1000
500
0
0
100
200
300
400
500
600


chassis and suspension
500
400
300
200
100
0
-100
-200
velocity (mps)
velocity (mps)
10
8
6
4
2
0
0
100
200
300
400
500
600