

Motor Control Simulink Simulation

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1 DC Shunt Motor Control

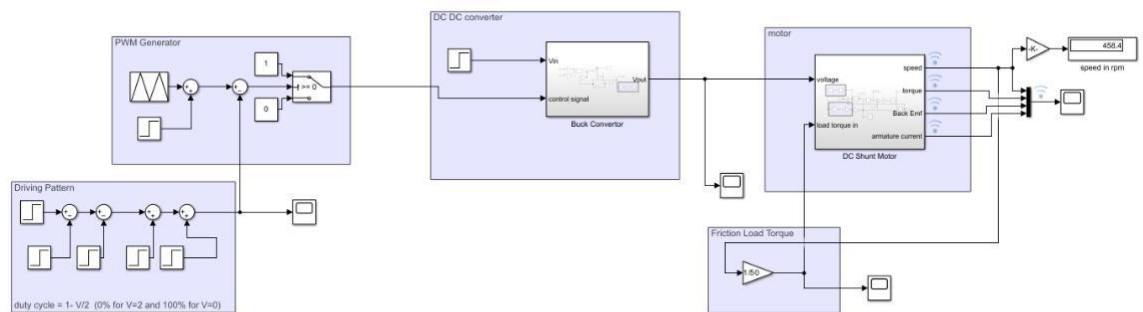


Figure 1: Simulink Model

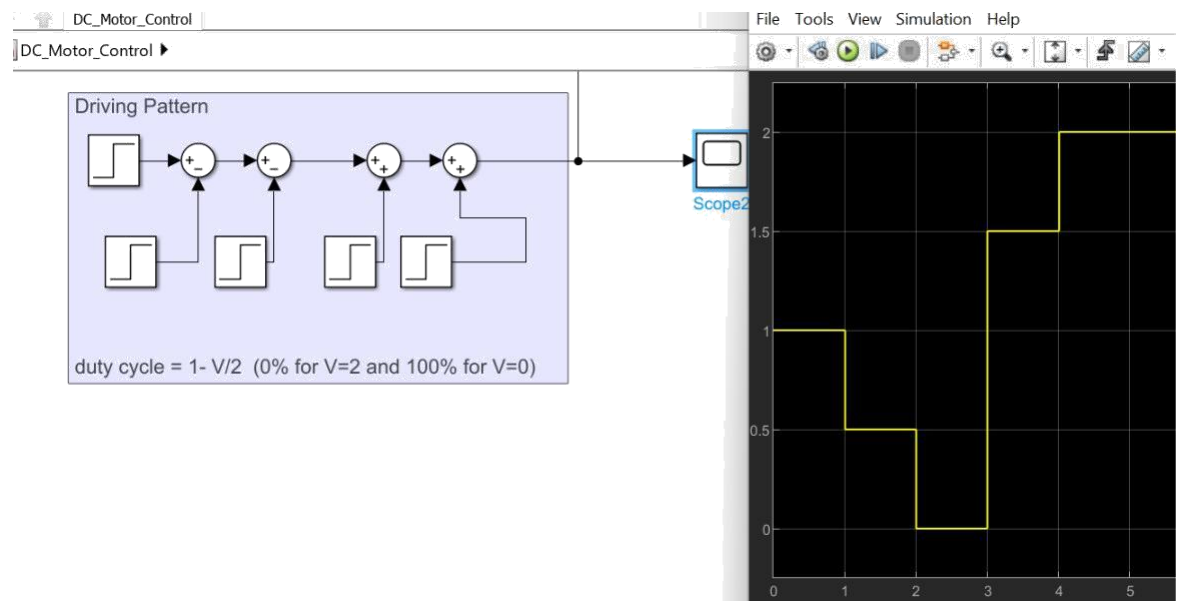


Figure 2: driving pattern

- Acceleration During 0 to 3 seconds then deacceleration and braking.
- PWM generator generates PWM waves with duty cycle decided by the driving pattern.
- Buck Converter acts as a variable power supply controlled by the PWM waves with a max voltage of 240 volts.

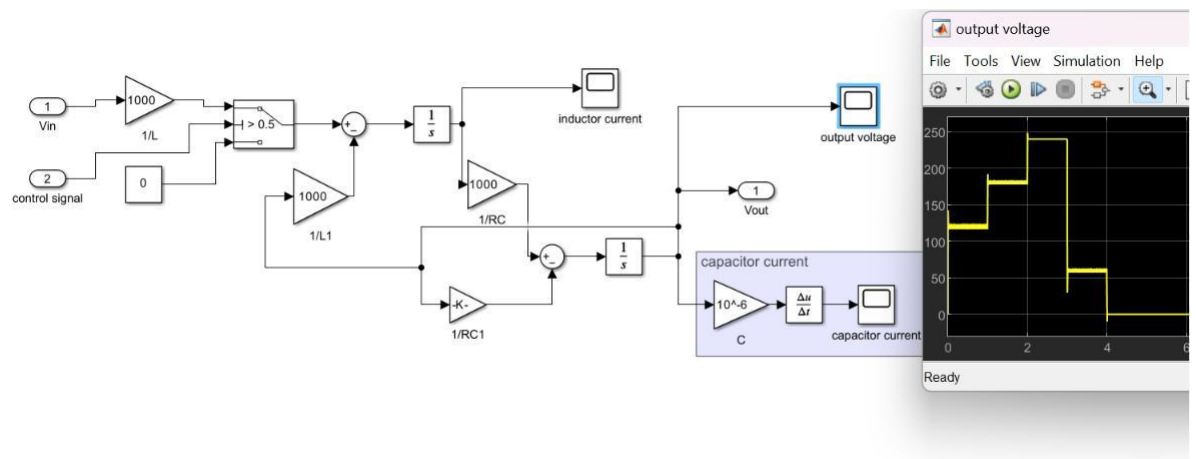


Figure 3: buck converter

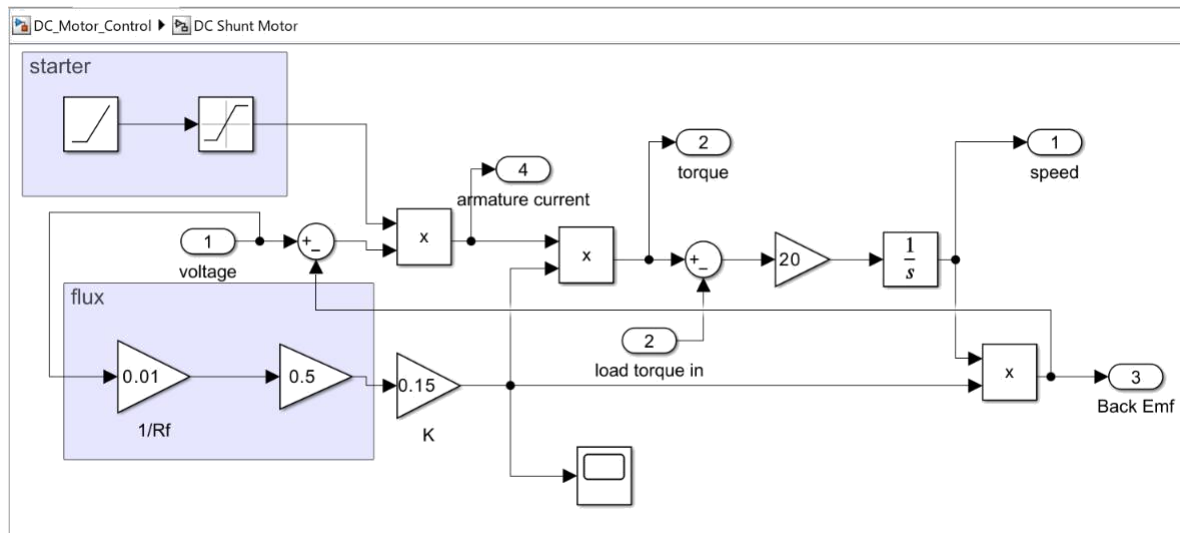


Figure 4: shunt motor

- For converting the shunt motor to separately excited motor, the flux section should be given a separate voltage source.

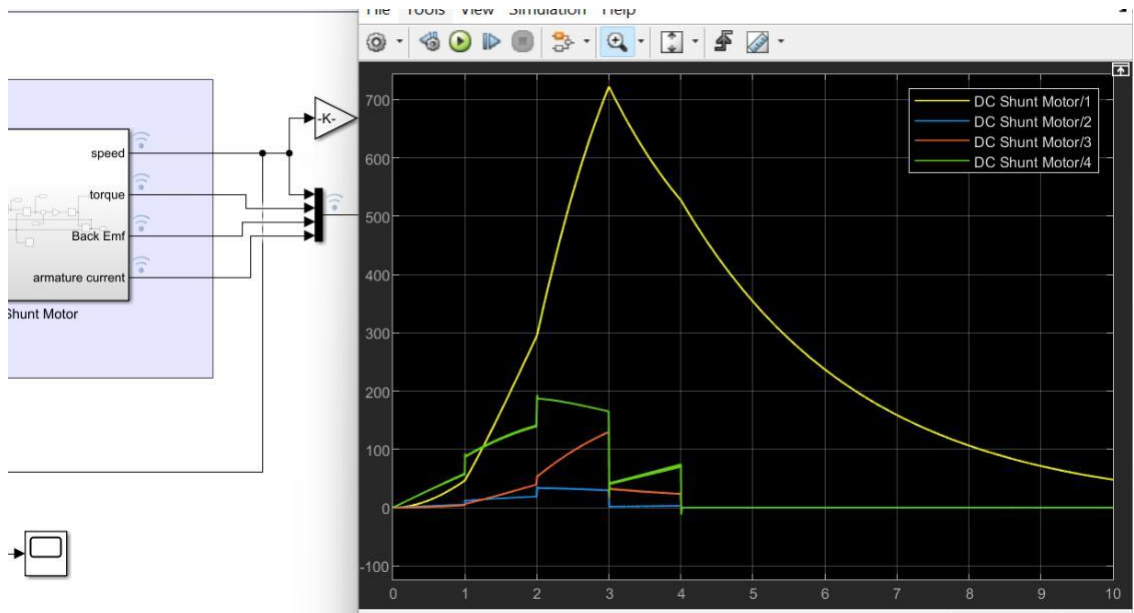


Figure 5: Shunt motor control Result

- From 3 to 4 seconds is the deacceleration phase and after 4 seconds its the braking phase.

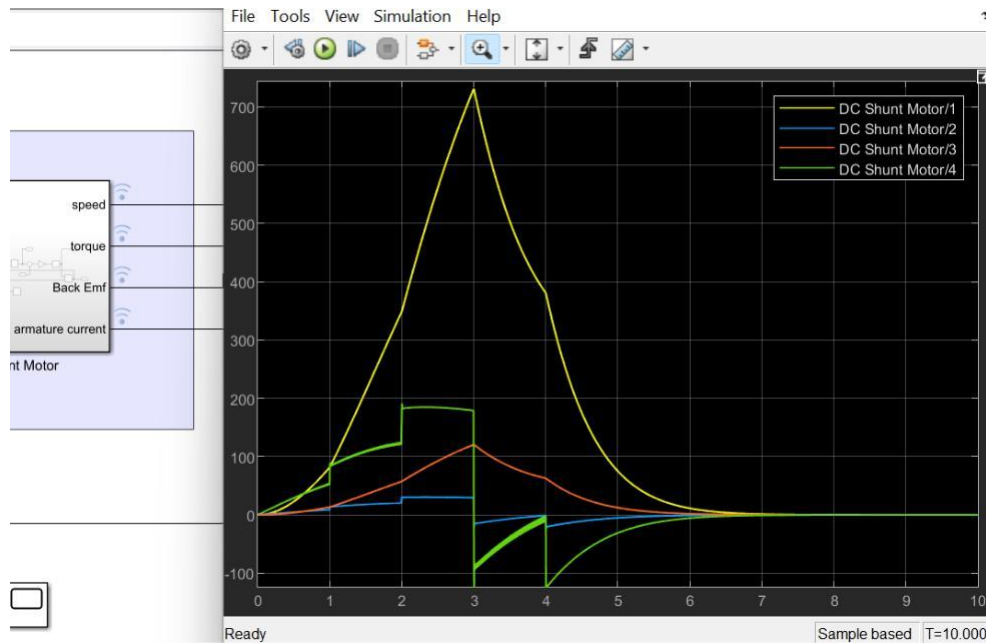


Figure 6: Regenerative Braking using Separately excited dc motor

- During deacceleration after 3 seconds the armature current becomes negative which can be reused to charge the battery.

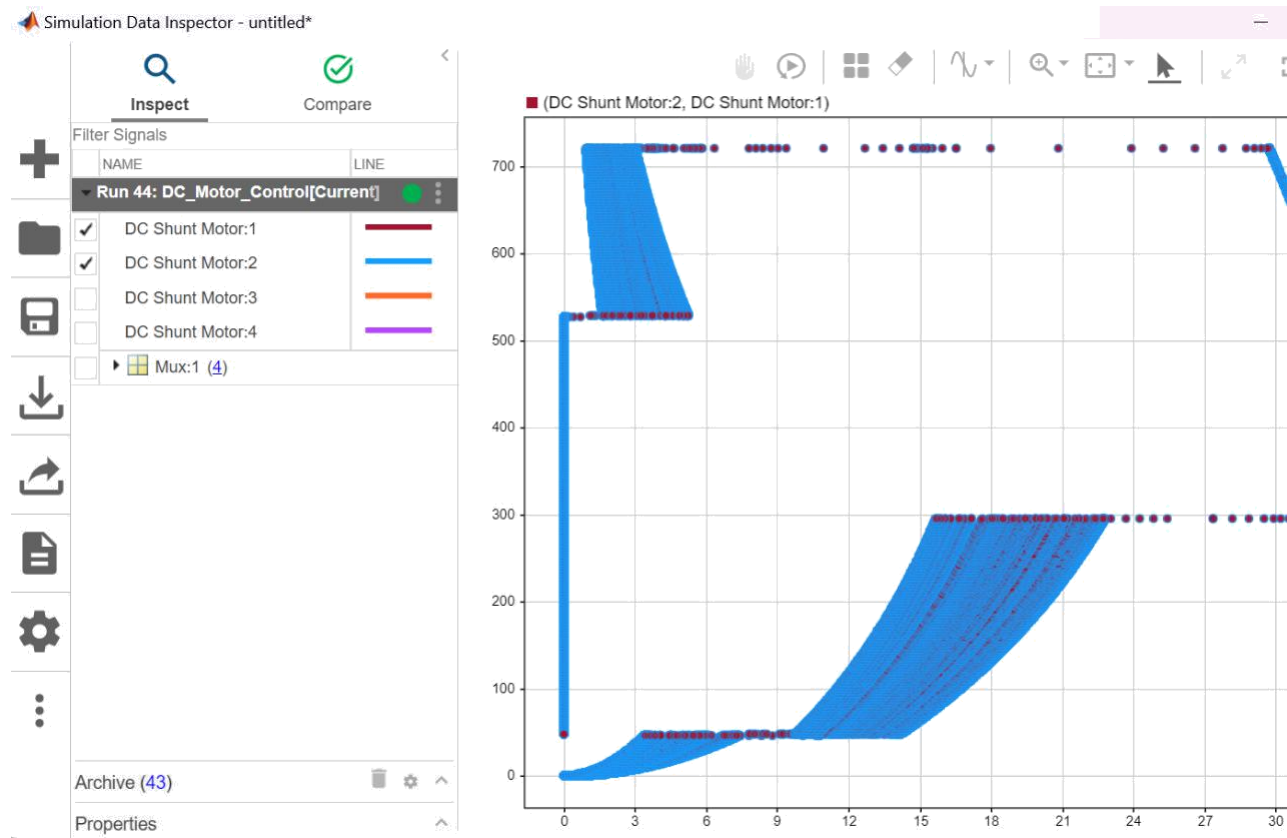


Figure 7: speed torque characteristics