Battery Electric Vehicle Design and Modeling

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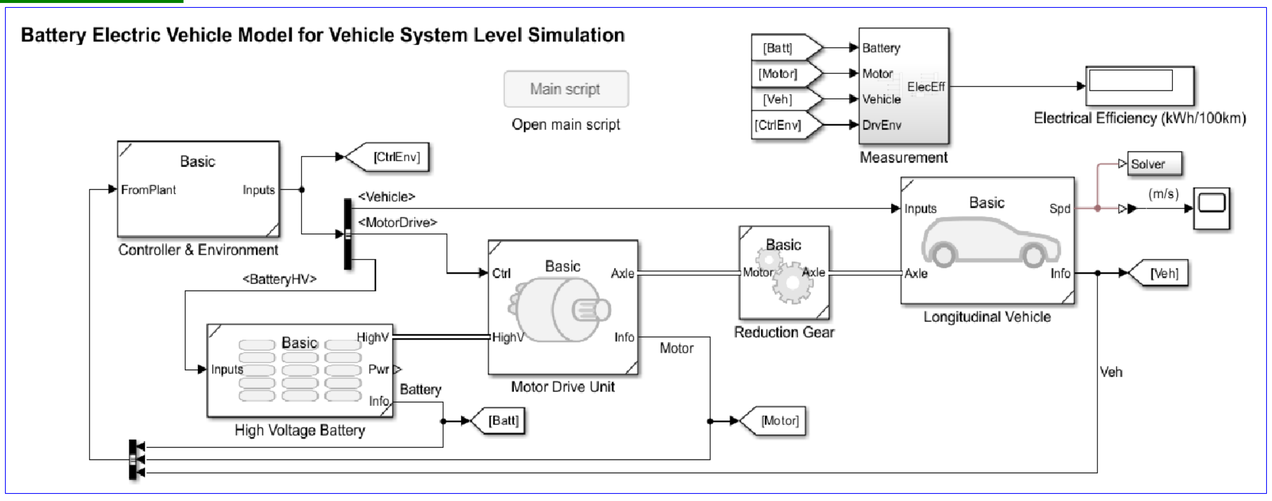
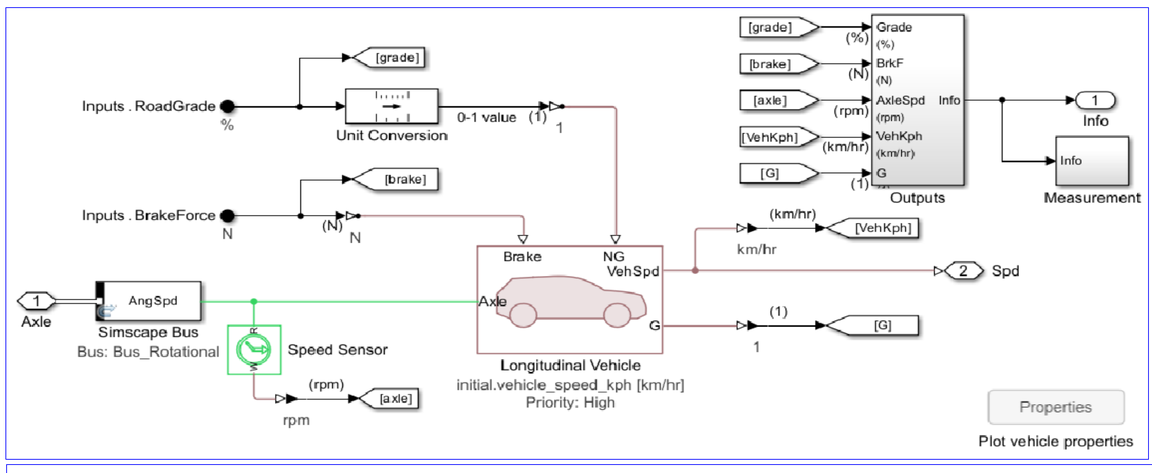
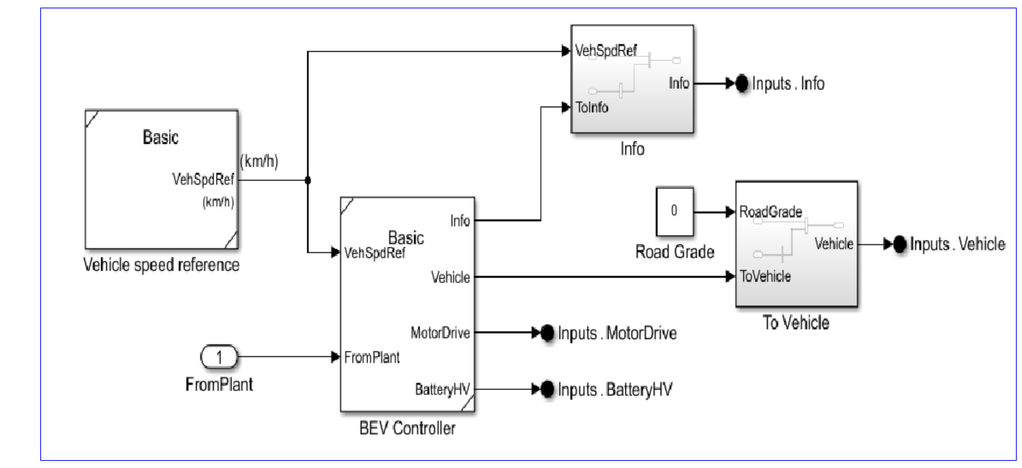
Abstract:

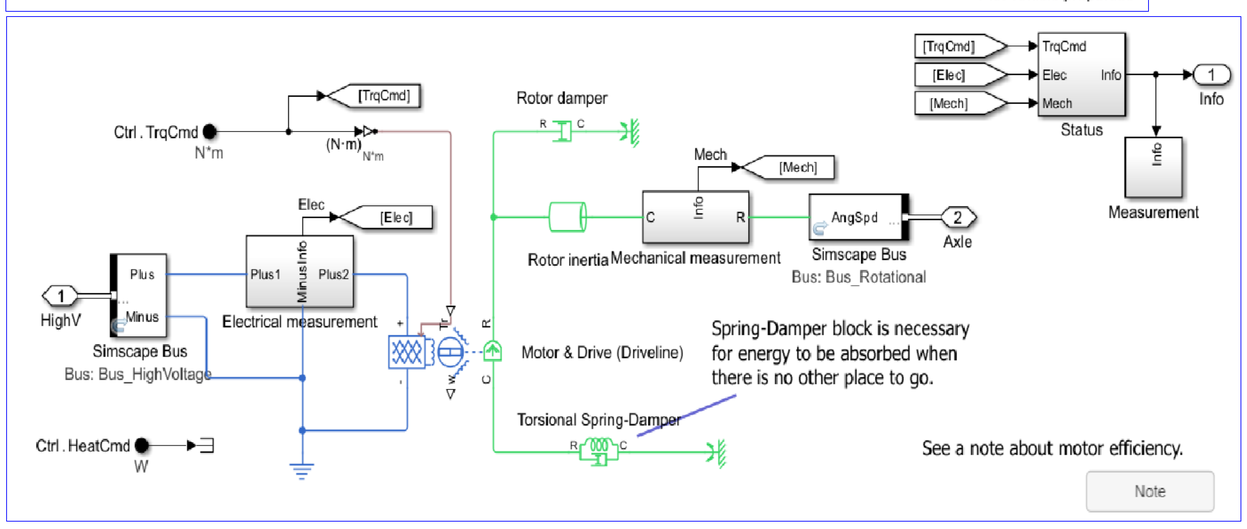
•The project focuses on the design and modeling of a battery electric vehicle (BEV) and its simulation over varied drive cycles.
• The primary aim is to record data pertaining to the performance of major components of the BEV over the test runs.
• Key feature of the project is the utilization of HIL testbeds, enabling greater precision of simulation results.
•The project leverages system-level modeling tools to create a comprehensive BEV model.
•It aims to address the unique driving patterns of Indian urban environments by incorporating specific drive cycles.

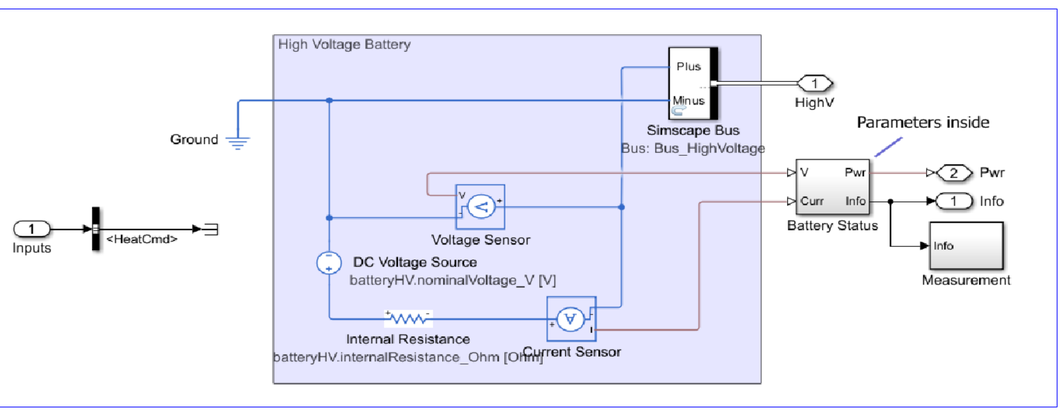
Setup-Map



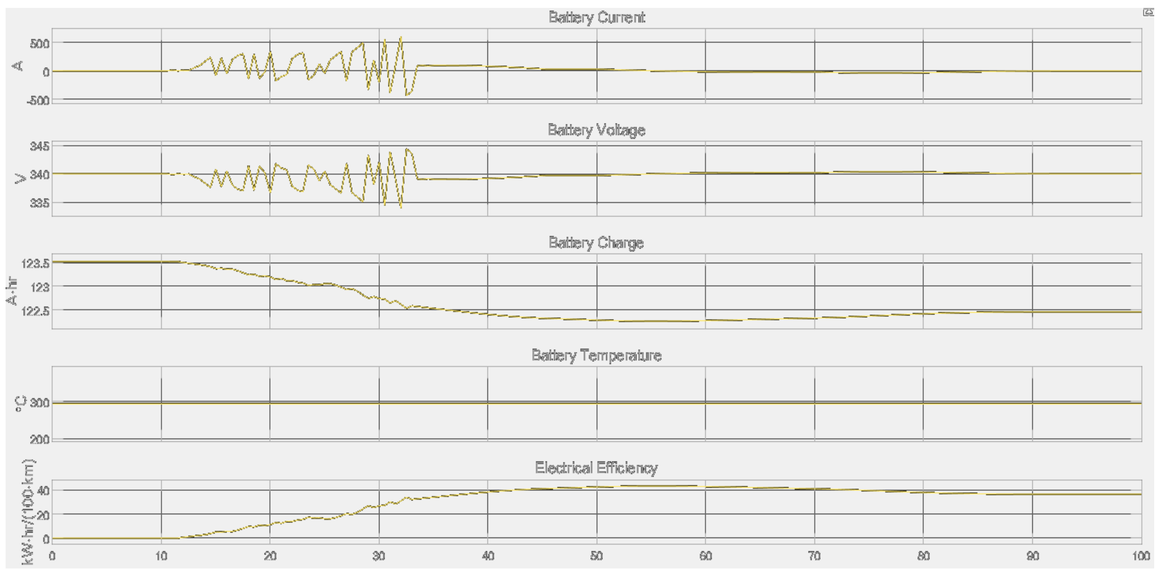


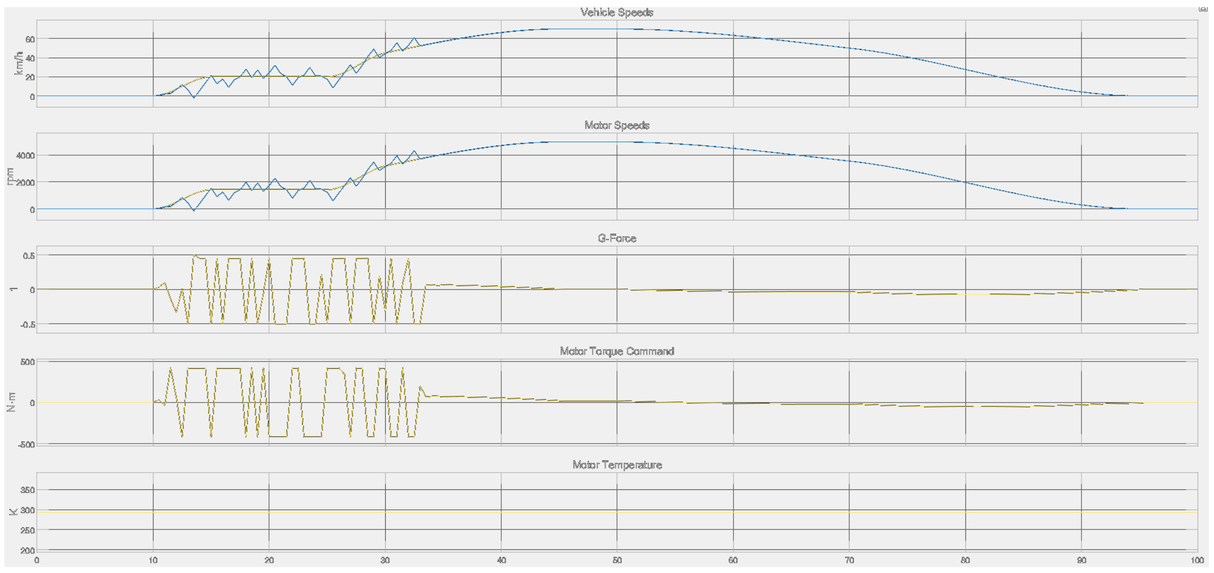






Results:





Recorded Battery performance parameters registered during Simulink run Operation.

Recorded Motor Drive and Vehicle performance parameters registered during Simulink run Operation.

Future Scope:

- The simulation results and the data on the performance of individual components shall be utilized in identifying and enhancing areas of improvements in the Battery Electric Vehicle.
- This is to be achieved by the development of controllers of greater optimality.
- Key segments are battery health and life cycle, longevity of the vehicle structure, and safer and comfortable driving experience.

References:

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2. J. Slough, M. Belcher, T. Tsui and S. Bhattacharya, "Modeling and Simulation of Electric Vehicles Using Simulink and Simscape," 2021 IEEE 94th Vehicular Technology Conference (VTC2021-Fall), Norman, OK, USA, 2021, pp. 01-06, doi: 10.1109/VTC2021-Fall52928.2021.9625192.

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