

Electric Vehicle Design and Simulation

Miss Nikita Sathawane¹ and Dr. U. E. Hiwase²

PG Student, Department of Electrical Engineering¹

Assistant Professor, Department of Electrical Engineering²

Priyadarshini College of Engineering, Nagpur, India

Abstract: *The need for modelling and simulation of hybrid electric vehicles (HEVs) is discussed in this study. Examples of power train component and system modelling are shown alongside various modelling approaches. This study presents the modelling and simulation of the hybrid electric vehicle (HEV) using MATLAB/Simulink. The purpose of this simulation tool is to aid in the design and assessment of the hybrid electric car. Driveline components can be changed, and the impact on a hybrid electric vehicle's efficiency can be researched. Both simulation tools use a Simulink vehicle model, in which the driveline parts are modelled as interconnected blocks that exchange physical signals on a second-by-second basis. In the demonstration, the HEV's various operational modes—accelerating, cruising, charging the battery while accelerating, and regenerative braking—are displayed over a full cycle.*

Keywords: Modelling and simulation of hybrid electric vehicles; simulation of hybrid vehicles; and physics-based modelling

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