

11-13 October 2023, Craiova, Romania, eISBN 979-83-50315-24-0

Performance analysis of an urban passenger vehicle powertrain operating in various driving cycle and speed profiles using matlab simscape models

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<https://doi.org/10.1109/SIELMEN59038.2023.10290803>

Abstract

The paper refers to the powertrain systems in urban electric passenger vehicles (EPV). The purpose of the work is to analyse the performance of the powertrain systems of an EPV with different parameters operating in various driving cycles and speed profiles. This paper introduces some modifications to the Simscape model of the EPV powertrain system model developed in previous studies. The analysis method uses the simulation modelling of the EPV powertrain and performance analyses during a standard driving cycle and speed profiles with a graphical and numerical representation of the results. Simulations show that the operating areas in which EPV powertrains work during urban and highway driving cycle profiles differ, and the efficiency of the EPV system overall is influenced, which can be improved by introducing a two-speed transmission in the EPV powertrain architecture.

Keywords: *driving cycle profiles, electric bus, powertrain system, simscape model, speed profile*

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2023 International Conference on Electromechanical and Energy Systems (SIELMEN)

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