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Performance Analysis of Different Power Electronics Structures for Electric Vehicles (EVs)

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Abstract : The aim of this paper is to establish an energy balance of the drivetrain of a low power electric vehicle (around ten kilowatts). The study is based on two topologies of power electronics converter, the voltage source inverter and cascaded H-Bridge inverter. For each of these solutions, two voltage levels are studied for the drivetrain. At first a discussion of cascaded H-Bridge inverters will be performed on the potential benefits of this structure for its use to other functions such as macroscopic batteries management system. In a second step, the performances of the traction chain are compared according to the structure of the power converter and the voltage level of the traction chain.

Keywords : power electronics, static converters, cascaded H-Bridge, traction chain, efficiency, losses, batteries balancing
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