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The Role of Chopper Circuits in Electric Vehicles

Mr. Pandurang Digambar Dahiphale

Lecturer, Department of Electronics and Telecommunication Engineering Amrutvahini Polytechnic, Sangamner, India pandurangdahiphale@gmail.com

Abstract: The increasing adoption of electric vehicles (EVs) demands advanced power electronic systems that are efficient, compact, and reliable. Among these, chopper circuits—also known as DC–DC converters—play a crucial role in optimizing energy usage, controlling motor speed, and enhancing regenerative braking performance. This paper explores various chopper topologies, their control strategies, and their impact on overall EV performance. Special emphasis is placed on buck, boost, and bidirectional choppers used in battery management and motor control.

Keywords: Electric Vehicles, Chopper Circuit, DC–DC Converter, Regenerative Braking, Buck Converter, Boost Converter, Bidirectional Chopper

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