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# Advanced Power Conversion System for Motor Drive in Electrified Vehicles.

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**Abstract:** *This paper presents a power conversion system for six-switch BLDC motor drive and fourswitch BLDC motor drive. Brushless DC (BLDC) motor drive have the advantage of high efficiency, high power density and low maintenance. These advantages make BLDC motor drive be widely used in industrial applications. In addition, the four-switch inverter will reduce the cost of the system with less switches. However, the problem of torque pulsation of four- switch BLDC motor drive is an intrinsic problem. To reduce torque pulsation, a novel DC/DC converter whose name is multi-purpose bi-directional DC/DC converter will be proposed in the thesis. This DC/DC converter with diode-assisted network will help improve boost ratio for the input of the BLDC motor drive. For the control system, PI controllers are used to control DC/DC converter and hysteresis control is employed for BLDC motor drive. Though there are other advanced methods for control, the PI controllers and hysteresis control can reduce the complexity of the whole system. Both six-switch and four-switch BLDC motor drives with the proposed system are simulated in PSIM software and the results are compared and discussed.*

**Keywords:** Electric Vehicle, BLDC Motor, PI Controller, PSIM Software

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