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# Fuzzy Direct Torque Control of Electric Vehicle with Dual Induction Motors Fed by Five Leg Inverter

Farid Kadri<sup>1[0000-0002-5440-5965]</sup> and Mohamed Assaad Hamida<sup>1[0000-0003-3682-2463]</sup>

<sup>1</sup> Université Kasdi Merbah Ouargla, Laboratoire de Génie Electrique, Faculté des Nouvelles Technologies de L'information et de la Communication, Algérie

ge.fkadri@gmail.com

**Abstract.** There are several possible EV configurations regarding the electric propulsion and the energy sources. In conventional dual-motor configuration, two three phase VLSI inverters are associated to dual induction motors drives. A novel structure is to associate only Five Legs Inverter (FLI) to drive the dual induction motors of the electric vehicle. In order to improve performance setting, a Fuzzy Direct Torque Control technique has been applied by using five legs inverter instead of six legs inverter to control the electric vehicle. The proposed Fuzzy Direct Torque Control can ensure the decoupling control and distribute the required torques to 1.5-kW dual induction motors drives. Simulations in SIMULINK/MATLAB environment are carried out to show that the developed fuzzy control is effective and provides a simple configuration with good performance in terms of speed and torque responses.

**Keywords:** Direct Torque Control (DTC), Dual Motor Drive, Induction Motor, Fuzzy Logic Control, Five Legs Inverter (FLI), Voltage Source Inverters (VSI).