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of

Electronic Differential with Direct Torque Fuzzy Control for Vehicle Propulsion System



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**Abstract:** We model an electronic differential that will offer the best vehicle stability on a curved road. The proposed traction system consists of two permanent magnet synchronous (PMS) machines that ensure the drive of two back-driving wheels. The contribution of each wheel to the advance of the vehicle is represented by an element conveying the accumulation of mechanical coupling. The proposed control structure is based on the direct torque fuzzy control for each wheel-motor. Different simulations have been carried out: vehicle driven on straight road, vehicle driven on straight road with slope, and vehicle driven over a road curved left and right. The simulation results show good vehicle stability on a curved road.

**Key Words:** Electric vehicle, electronic differential, direct fuzzy torque control, permanent magnet synchronous motor

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