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Performance analysis of the linear launcher motor via modelling and simulation for light electric vehicles

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Abstract:
This research aimed to analyse the linear launcher motor (LM) for the light electric vehicle (EV) application that generated a linear movement. LM will replace the piston engine and eliminate the internal combustion engine (ICE) issues namely engine weight and friction at piston wall. The finite element magnetic softwares (FEMs) for a magnetic field was described in this study by predicting the magnetic flux relationship using a 2D J-Mag software. In addition the finite element (FE) analysis was used to simulate the linear launcher motor by using MATLAB/Simulink software. The results show that the linear launcher motor can generate the axial force, speed, and displacement of with and without load. The maximum force without load was ~1.6kN while force with load was ~1.4kN at 100A supplied. The comparison between the force without load and load force was different by12.5%