

Magnetic-g geared dual-rotor motor (MGDRM) is receiving increasing attention due to its advantages as a kind of pure electrical power split device for the series-parallel hybrid powertrain. This paper performs a systematic study on the analysis and control model of the complementary MGDRM. The principle of the complementary MGDRM is illustrated in detail. The torque production and flux-weakening ability of the complementary MGDRM are analyzed by the analytical method and a revised 2D FEA method. The field-oriented-control (FOC) method for the MGDRM is first realized in this paper. On the basis of the FOC model, the torque production and flux-weakening control in a wide speed range can be implemented. The static and dynamic performances of the MGDRM are analyzed based on the FEA and simulation models. The experiments on a prototype of the complementary MGDRM are carried out to validate the study.