

## Starting Characteristic Analysis of LSPM for Pumping System Considering Demagnetization

**Authors :** Subrato Saha, Yun-Hyun Cho

**Abstract :** This paper presents the design process of a high performance 3-phase 3.7 kW 2-pole line start permanent magnet synchronous motor for pumping system. A method was proposed to study the starting torque characteristics considering line start with high inertia load. A d-q model including cage was built to study the synchronization capability. Time-stepping finite element method analysis was utilized to accurately predict the dynamic and transient performance, efficiency, starting current, speed curve and, etc. Considering the load torque of pumps during starting stage, the rotor bar was designed with minimum demagnetization of permanent magnet caused by huge starting current.

**Keywords :** LSPM, starting analysis, demagnetization, FEA, pumping system

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