

High Thrust Density Transverse Flux Linear Motor: Thrust Analysis and Driving Method.

ABSTRACT

This paper present characteristic model of a novel High thrust Density Transverse Flux Linear Motor (HDTFLM). The analytical method is explained, and its results are compared with the simulation. The simulation results for the thrust and cogging force of HDTFLM are validated with the measurement results. In this research a single-phase model was used that has the advantage of having independent magnetic circuit on each phase of the proposed HDTFLM. Moreover, a single-phase model consumes less time of simulation rather than a three-phase model. The simulation results of thrust are achieved using 3D-FEA. Finally, the prototype HDTFLM is derived with Permanent Magnet Stepper motor (PMST) configuration.

Keyword: Linear Motor; High thrust Density; Transverse Flux; Permeance; Finite Element Analysis (FEA)