Research on the Characteristics of a Linear Synchronous Motor in the Steady State

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Abstract— The steady state characteristic of a linear synchronous motor (LSM) used in the high speed magnetic levitation system of electromagnetic type is analyzed with finite element method (FEM). The LSM mathematical model for numerical computation is presented, and then a global linear equation for LSM is got. Preconditioned Bi-conjugate Gradient method (PBCG) is used to solve the large scale and sparse linear equation for fast solutions. Magnetic field distribution for LSM is obtained. Finally, the software, including mesh generation, numerical computation and post-processing, is made for the analysis of the LSM characteristic. The function of the software is introduced through the LSM computation. The various LSM characteristics including non-load and full load are displayed.