Tooth-Layer Permeance Function Generation Method for Doubly-Slotted Motor

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Abstract—A function generation method of tooth-layer permeance for doubly-slotted motor is presented in this paper. Tooth-layer permeance is dealt with by function generation method applying Fourier analysis, and it varies with only tooth-layer magnetomotive force $F$ without maladjusted angle $\alpha$, then the motor performance is calculated by analytical method similar to air gap rate permeance method. Based on the analysis of tooth-layer permeace for doubly-slotted motor, the function generation theory of tooth-layer permeance is presented, and the result is compared with general calculating result. The influence rule on the components of tooth-layer permeance with tooth-layer parameters is analyzed and the magnetic network model is established based on this method. Step forward, the maximum electromagnetic thrust force of a double-slotted linear motor prototype is calculated with a good solution for nonlinear problem due to saturation.