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# Influence analysis of the geometrical parameters on the ac loss of the double sided linear HTS induction motor under various operation conditions

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Generally, the double sided linear HTS induction motor has higher propulsive force and higher efficiency because the HTS windings can carry higher current with lower loss. In this paper, the primary side of the proposed linear motor is made from silicon steel sheet, and ReBCO HTS tapes are used to wind the armature windings which are settled into the iron core. The secondary sides are made from copper plate and iron plate. Because the primary side is made from ferromagnetic material, it effects on the critical current and ac loss of the HTS coil, and then effect on the performance of the motor. To study the influence of the geometrical parameters of the primary iron core on the ac loss, a 2D model for the double sided linear HTS induction motor by T-A formulation is proposed in COMSOL. With the help of the model, the influence of the geometrical parameters, such as the width of the teeth and the height of the yoke, on the critical current and ac loss of the coils is studied systematically. Meanwhile, the typical operation conditions are taking into consideration, such as no-load operation condition, rate-load operation condition, and over-load operation condition. This work is very helpful for fully understanding the influence of the geometrical parameters on the ac loss of the coils and then estimating the performance of the motor.

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