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Study on the Retaining Sleeve Structure for the Reduction of Eddy Current in SPMSM

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Abstract : In high-speed SPMSM design, the rotor-retaining sleeve is inserted into rotor to prevent permanent magnet's damage. It is quite efficient way considering manufacturability, but the sleeve becomes major source of ohm loss in high-speed operation. In this paper, the high-speed motor for turbo-blower at the rating of 100kW was introduced. To improve its efficiency, the retaining sleeve's optimal design was needed. Within the range of satisfies the mechanical safety, sleeve's some design variables have been changed. The effect of changing design variables of the sleeve was studied. This paper presents the optimized sleeve's advantages in electrical efficiency from the result of electromagnetic FEA (finite element analysis) software. Finally, it suggests the optimal sleeve design to reduce eddy current loss, which is related to motor shape.

Keywords : SPMSM, sleeve, eddy current, high efficiency
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