A New Geometrical Construction using Rounded Surfaces proposed for the Transverse Flux Machine for Direct Drive Wind Turbine

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Abstract

This paper proposes a new construction for transverse flux machines (TFM) using a rounded surfaces core geometry. The new concept has been developed for TFM with U core geometry \cite{1}, \cite{2}. In this case a new analytic design procedure was proposed. The rectangular initial machine model is presented in Figure 1. The rounded geometry is shown in Figure 2.

The analytic design of the new TFM construction is further improved by FEM modelling and analysis. Using the new concept, a significant reduction of the active materials is obtained. The innovative geometry also provides a uniform magnetic field in the core structure. According to the comparison of both the TFM with prismatic and rounded core geometries the new proposed concept is more attractive for the direct-drive wind turbine application.

References

\cite{1} F.T.V.Nica, E. Ritchie, K. Leban, ”A Comparison Between Two Optimized TFPM Geometries fot 5MW Direct Drive Wind Turbines”, 8\textsuperscript{th} International Symposium on Advanced in Electrical Engineering, ATEE, 2013, Bucharest, Romania