Heat Modelling Methods Comparison

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Abstract

The design of electrical machines is very complex and complicated task. The thermal parameters are as important at the design process of electrical machines as the electrical and mechanical parameters. A good thermal model can significantly cut down the expenditures to save time and energy. Nowadays there is lots of designing software tool available (e.g. FEM software). The licenses of this software usually are very expensive. In some cases, the hot spot analysis can give us enough information about the system's thermal behavior (e.g. insulation system). Thus, the thermal model could be simplified. On the other side by using Finite Element Method, Finite Difference Method or Thermal-Electrical analog models [1, 2] can give us a more complex approach to simulate the thermal behavior of the system. The latter from them could be advantageous just for that reason because freeware software can be used for it like LTSpice. Transient or stationer simulation can be performed. The objective of this work is comparing the different methods, focusing on practical aspects.

References

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2. L. Imre and J. Barcza. Villamos gépek melegedése és hűtése. Műszaki könyvkiadó, Budapest, 1982.