

# Development of High-Speed and Highly Accurate Numerical Analysis Technology of Rotating Machine by 3-D Finite Element Method

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## Abstract

The improvement of efficiency of rotating machines has been strongly desired to address environmental problems.

The aim of this project is to develop a parallel computing method using the 3-D finite element method for the magnetic field analysis of rotating machines, and to achieve the high-speed and highly accurate large-scale magnetic field simulation of rotating machines.

In this report, we achieved a large scale eddy current analysis of an IPM motor taking into account laminated structure of its cores by applying a parallel computing method which has been developed in this project until last fiscal year. The eddy current in the electrical steel sheets caused by the axial flux is simulated in high accuracy and high speed by the Earth Simulator.

**Keywords:** rotating machine, magnetic field analysis, finite element method with edge elements, laminated core