

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

## Project Representative

Masanori Nakamura

TOYO DENKI SEIZO K.K.

## Authors

Masanori Nakamura<sup>\*1</sup>, Yoshihiro Kawase<sup>\*2</sup>, Tadashi Yamaguchi<sup>\*2</sup>, Tomohito Nakano<sup>\*2</sup>,

Noriaki Nishikawa<sup>\*3</sup>

\* 1 TOYO DENKI SEIZO K.K.

\* 2 Gifu University

\* 3 Japan Agency for Marine-Earth Science and Technology

## 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, a large-scale numerical analysis for eddy current in laminated cores of an interior permanent-magnet motor is achieved. The eddy current in the laminated cores caused by axial flux is simulated by using Earth Simulator.

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