The magnetic simulation using JMAG and Simpleware

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Abstract :
We carried out a magnetic field simulation for magnetic components using JMAG and Simpleware. The Simpleware can make various types of FEM models from 3D image data. Here, a magnetic simulation has been achieved by importing an FEM model which was made from 3D Computer Tomography (CT) image data. By incorporating that model into JMAG we analyzed the magnetic field. We would like to introduce that analysis case study.

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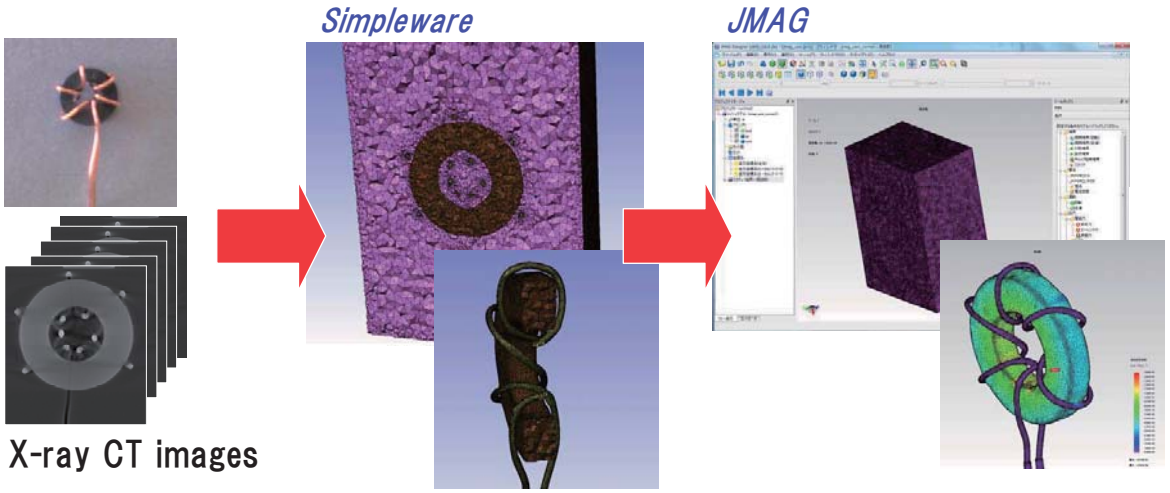
Abstract of the Report

- Magnetic Field Analysis Using Simpleware and JMAG



Realized analysis with actual models from the X-ray CT images by coupling between Simpleware and JMAG

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X-ray CT images (Toroidal images)

TOHKEN

TUX-3200

Mounts 0.4 μm resolution X-ray source

Cooperation by TOHKEN X-RAY INSPECTION Co., LTD.

Toroidal

Perspective image

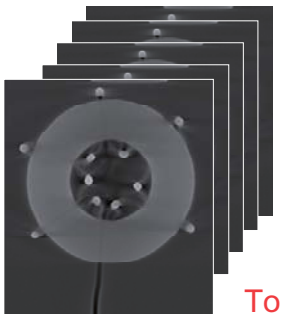

Image re-formation

Toroidal CT images

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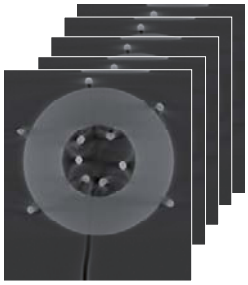
3D Modeling+Mesh Generation (Simpleware)

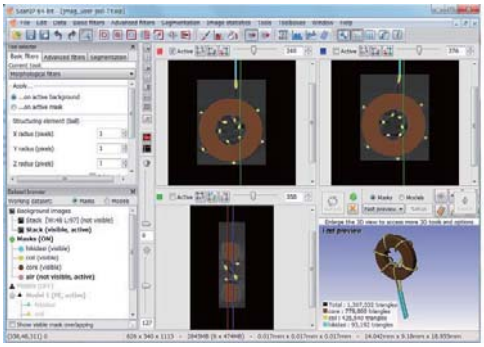
- Modeling using Simpleware



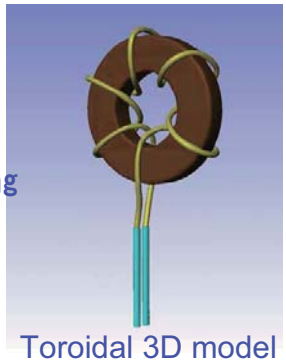
Toroidal CT images

Stack of images

Modeling using Simpleware



Modeling+Meshing



Toroidal 3D model

Modeling+Mesh Generation from CT data on Simpleware

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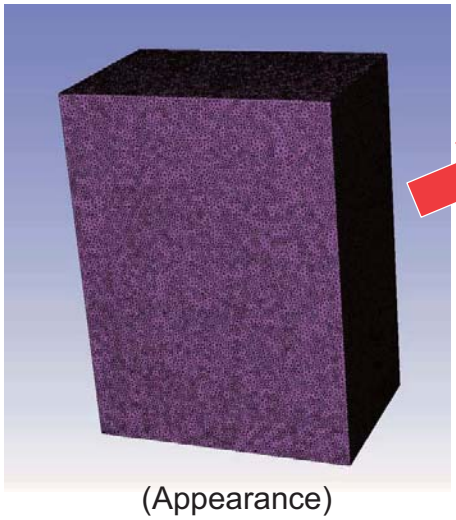
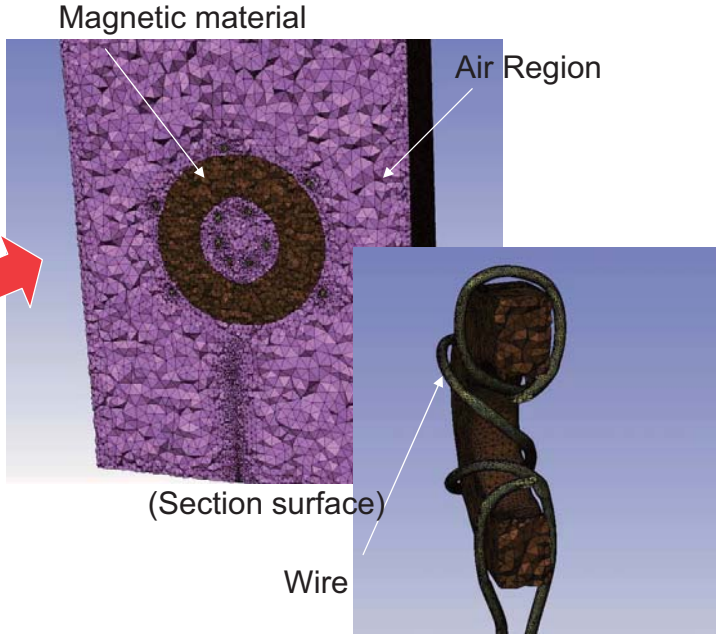
3D Modeling+Mesh Generation (Simpleware)

- Generated FEM model

Total：1,169,564[elements]



(Appearance)



High quality mesh generation is possible even for curved surface and complicated geometries.

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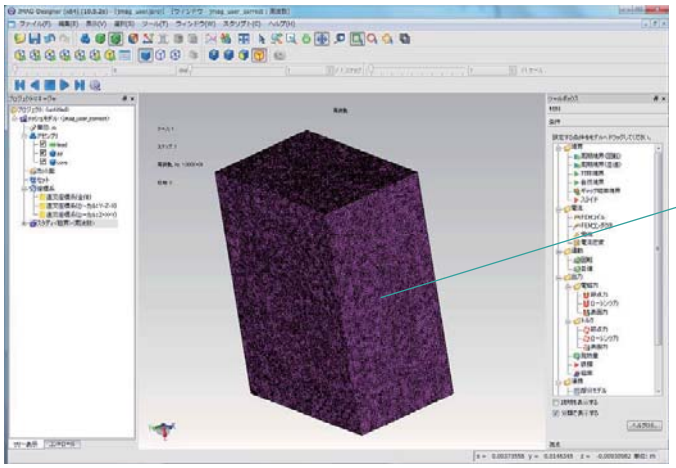
The Magnetic Field Analysis Linking to JMAG

- Magnetic Field Analysis using JMAG

  Transferring the FEM model created using Simpleware to JMAG-Designer after loading it on JMAG-Studio in the Nastran format.



Model after being loaded on JMAG-Studio

Carrying out a normal analysis is possible after loading on JMAG-Designer.

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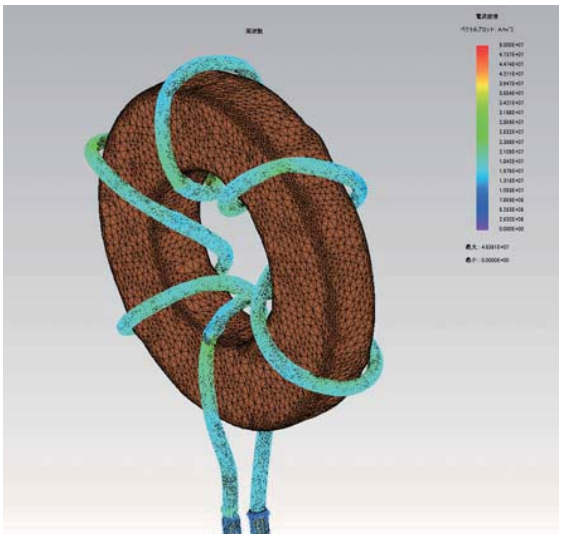
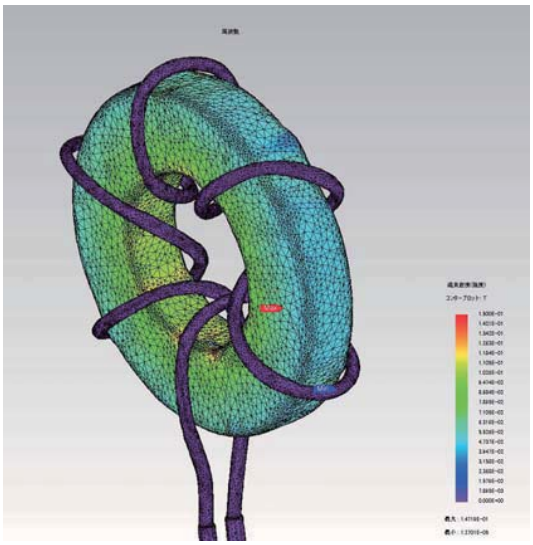
Analysis Results using JMAG

- Analysis results by frequency analysis



Vector plot (Current density)



Contour plot (Magnetic flux density)

Realized the more detailed and accurate magnetic field analysis even with the actual small and complicated structures.

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