

# Bachelor's or Master's thesis

## Analysis of the efficient induction heating frequency

Induction heating is a heating process of electrically conductive materials. The process is driven by an electromagnetic field. Alternating current passing through an induction coil creates an electromagnetic field. The electromagnetic field itself penetrates the conductive material, generating eddy currents. The eddy currents heat the object by Joule heating.

Numerous production applications of induction heating support research interest in this field. Engineers and researchers face many multiphysical problems in the induction heating process. The first problem they usually face is adjusting the frequency of the alternating induction current. The frequency adjusting allows them to control eddy currents distribution and the heating process in general.

This project aims to solve two problems. The first problem is calculating the most efficient induction heating frequency for the predefined layout (Figure.1). The second problem is developing a model allowing recalculations of the most efficient frequency for small changes in the predefined layout.

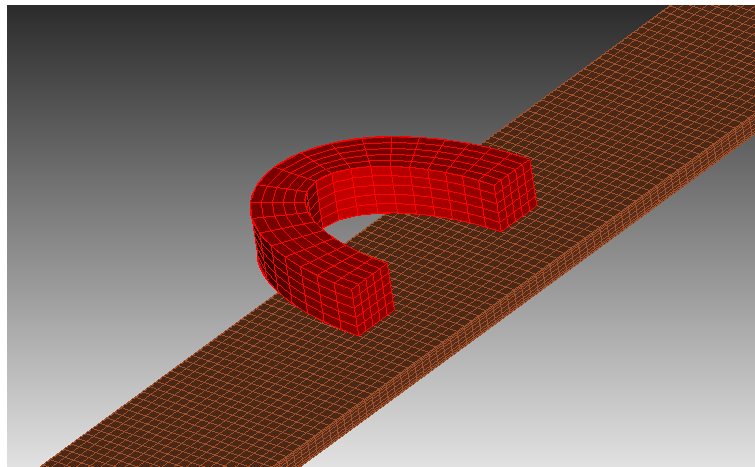


Figure 1: Example of the layout. Red - induction coil, brown - steel belt

### Expected knowledge :

- Finite element method
- Basics of electromagnetic theory

**Keywords:** FEM / Electromagnetic / Induction heating / Bachelor's thesis / ...

**Area of expertise:** Numerical simulations / Modeling / Multiphysics simulations