POSTER EXPOSITION

Poster 9

University of Strathclyde Glasgow

A novel finite element model for 2D induction heating based on the bound preserving method

Katherine MacKenzie

AUTHOR OF POSTER:
Katherine MacKenzie

INSTITUTION:
University of Strathclyde

OTHER AUTHORS:
Dr Gabriel Barrenechea, University of Strathclyde
Dr Aurik Andreu, University of Strathclyde

ABSTRACT:

In induction heating, it is important to understand the temperature profile within the material for maximum throughput, efficiency and control, but also to avoid overheating and melting of workpieces. However, due to high temperatures strongly affecting materials properties and shallow skin-depths, it is difficult, time-consuming, and expensive to accurately measure the temperature evolution. Therefore, numerical models are useful to predict the temperature profile for different shapes of materials, different types of steels and alloys, and different system setups.

In this poster, I will present a novel 2D model for induction heating. This model is built using the freely available python software FEniCSx, makes use of adaptive meshes, and employs a new finite element method called the Bound Preserving Method. I will present results that compare the model output to experimental data and to output from industry-standard DEFORM software and show that this model could be useful in certain applications.

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