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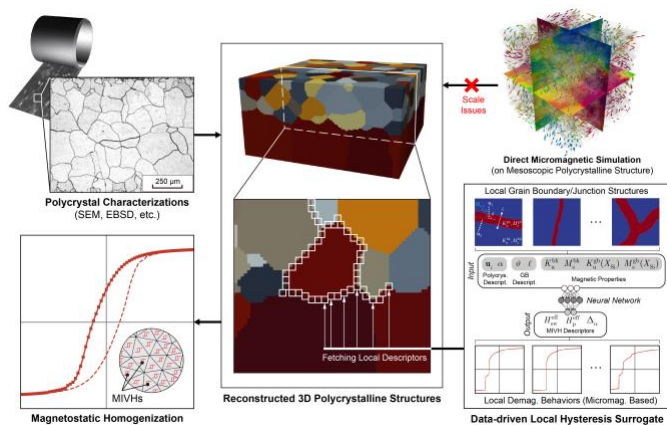
HiWi, ARL, Bachelor or Master Thesis topic available

Micromagnetic modelling of grain boundary regions in iron-silicon systems

at the Division of Mechanics of Functional Materials in the institute of Material Science, TU Darmstadt

FB 11 – Material- und Geowissenschaften

Fachgebiet Mechanik funktionaler Materialien

MECHANICS of FUNCTIONAL MATERIALS

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Motivation

Iron-Silicon alloys play an important role in electricity generation as well as transmission and electric mobility. During frequent magnetic cycling energy is lost through various processes, reducing these losses poses a major challenge to the design of next generation electrical machines. In this manner investigating the relationship between microstructure, local features, energy losses and hysteresis behavior is investigated.

This work belongs to part of the collaborative research center (CRC) and Transregio (TRR) 361 with an international consortium of universities, funded by DFG and FWF. The candidate will work on simulation of the influences of local features in proximity of grain boundaries on the hysteresis behavior. The results of these simulations will furthermore be used to set up a neural network informed by these results.

Methods

- Micromagnetics
- Machine learning
- Microstructure reconstruction

To Do

- Identification and extraction of local features
- Statistical evaluation of microstructures
- Implementation of neural-network

Interested? Please Contact:

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