

Project/Mini thesis

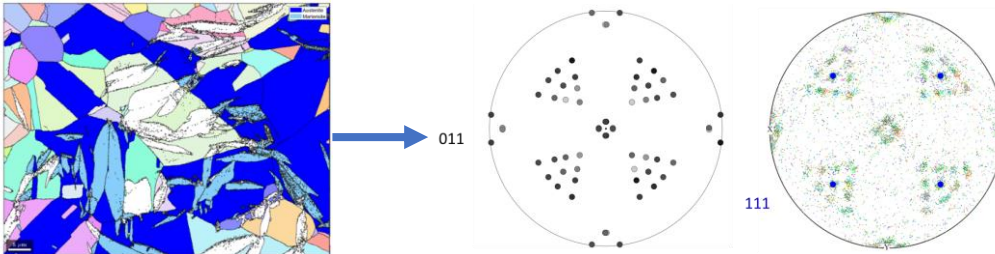
Investigation on the orientation relationship of martensite/ austenite by variant detection in FeNiC and FeNiCSi



Institute for Physical Metallurgy and Materials Physics

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The determination of an orientation relationship (OR) between martensite (bcc) and austenite (fcc) is of general economic and scientific interest. The reason for this is the character of the interphase boundary, which affects the mechanical properties of the materials. In the field of interfacial engineering, it is relevant to create different ORs in order to optimize technologically variable material properties, such as mechanical strength, fracture toughness, stress corrosion or drawability.

With the aid of a scanning electron microscope (SEM), orientation maps can be obtained using electron backscatter diffraction (EBSD), which describe the spatial orientation distribution. Comparing this technique with single orientation measurements in the transmission electron microscopy (TEM), the most important advantage is the higher statistical significance of the discovered ORs, since an orientation map contains several hundred thousand single measurements, which is automatically evaluated in only a few hours and can record several thousand grains.

In this work, an open source code is developed in Python based on an existing Matlab code and validated by means of EBSD measurement data sets.

Task:

What we offer:

- Experience in microstructure evaluation (EBSD) and EBSD data analysis
- Collaboration with a young, motivated team.

The ideal candidates have:

- A high level of motivation for familiarisation with Python/Matlab programming
- Interest in experimental materials science
- You have a technical, physical or mathematical background with corresponding interests and skills.

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