Project / Master Thesis

Development of an automated tool for 5 parameter 2D-Interface Boundary Stereology

BSE with high resolution

EBSD with low resolution

Registered BSE image on EBSD map

Subpixel edge detection

Trujjillo-Pino, 2013

Reconstruction of Interface Distribution

MRD
3.16
2.93
2.70
2.46
2.23
2.00
1.76
1.53
1.30
1.06
0.83

Saylor, 2004
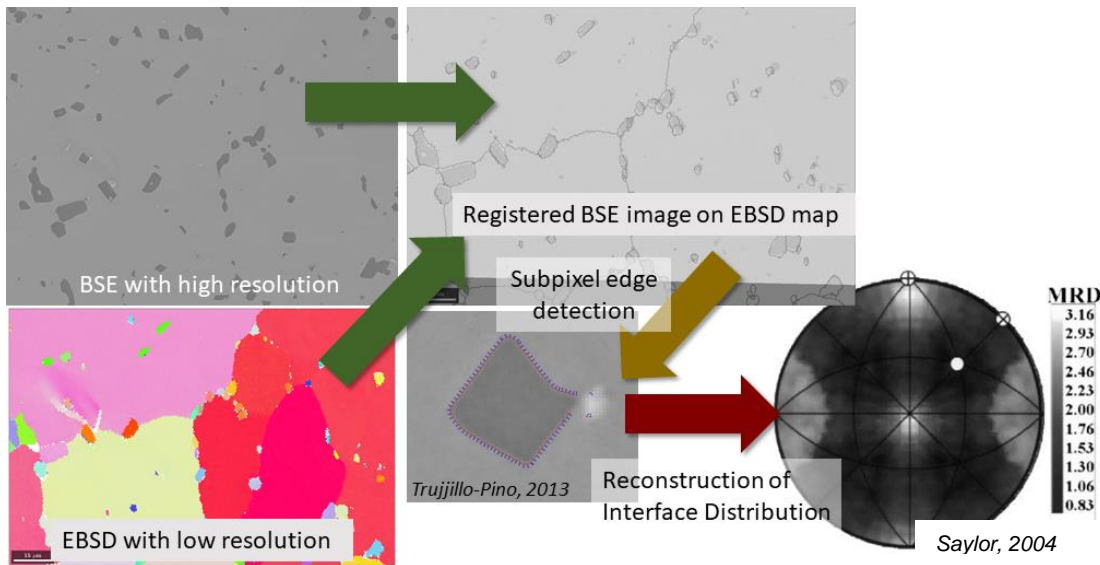
Motivation:

Grain and Interface Boundaries are governing multitudinous properties of metallic structural materials. However, the total description of these boundaries is complex, such that for the geometrical description already 5 parameters are needed. While the orientation relationship between phases can be easily recovered by means of EBSD measurements, the orientation of the Interface plane is not completely defined in 2D images. This can be overcome by stereological concepts and evaluation of a larger number of grain boundaries. Therefore you, as applicant should couple an existing code, that extracts the 2D face normals based on edge detection with the MTEX Toolbox methods.

Tasks:

- ¬ Literature Research on Stereology measurement of phase / grain boundaries
- ¬ Method development of stereology algorithm based on existing literature in the MTEX toolkit
- ¬ Application of the method to the Mg-Al-Ca alloy + possibly SEM imaging

What we offer:

- ¬ Work in a enthusiastic team of material engineers
- ¬ Possibility to work with a modern Scanning Electron Microscope

The ideal candidate will:

- ¬ Have a high motivation to dive into stereology and MATLAB coding
- ¬ Have experience in programming with MATLAB (or other Languages)
- ¬ Have a good spatial imagination and basic knowledge of crystallography

Earliest projected starting date:

Anytime (as soon as possible)

Contact:

Lukas Berners
Room E04, Tel.: +49(0)241 80-80 28 297
berners@imm.rwth-aachen.de

Institut für Metallkunde und Materialphysik

Direktorin:
Prof. Dr. Sandra Korte-Kerzel

Postanschrift/Mail:
RWTH Aachen
52056 Aachen
Germany

Gebäude/Deliveries:
Kopernikusstraße 14
52074 Aachen

Tel.: +49 (0)241 80-26855
Fax: +49 (0)241 80-22301

imm@imm.rwth-aachen.de
www.imm.rwth-aachen.de