Paul-Drude-Institut für Festkörperelektronik (PDI) - https://www.pdi-berlin.de/

Paul-Drude-Institut für Festkörperelektronik

PDI is a research institute in Berlin, Germany. We perform basic and applied research at the nexus of materials science, condensed matter physics, and device engineering.

Elastic strain fields of dislocation and dislocation networks as derived by numerical extended FEM (XFEM) and analytical tools

Master Thesis Topic, Microstructure

City: Berlin; Starting date (earliest): At the earliest possible; Remuneration: 13,90 €/hour; Closing date: 31/03/26

Tasks

The strain field by a single dislocation can be calculated based on text-book knowledge, however,
more complex arrangements usually require numerical approaches. Numerical extended finite element methods (XFEM) may serve as a versatile tool to consider highly realistic geometries and full elastic anisotropy (particularly in 2D layered materials or materials with low crystal symmetry or high anisotropy). A detailed knowledge of the resulting strain landscape contributes to a better understanding of the elastic properties and potentially provides the key to drive plastic relaxation pathway.
Objectives:
Creating XFEM cases for single and multiple dislocation arrangements in various crystallographic systems (e.g., isotropic, cubic and trigonal) and compare results to analytical calculations.

Requirements

Background in semiconductor physics, materials science, or related fields.
Experience in numerical data treatment as e.g. python but not necessarily Finite Element code

What we offer

Opportunities and Benefits:

- Modern computational infrastructure
- Supportive environment with experts for various scientific sub-fields
- International and culturally diverse community
- Location in the heart of Berlin with excellent public transport connections
- Subsidized travel ticket

Application

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More information at https://stellenticket.de/201883/BEUTH/
Offer visible until 26/03/26