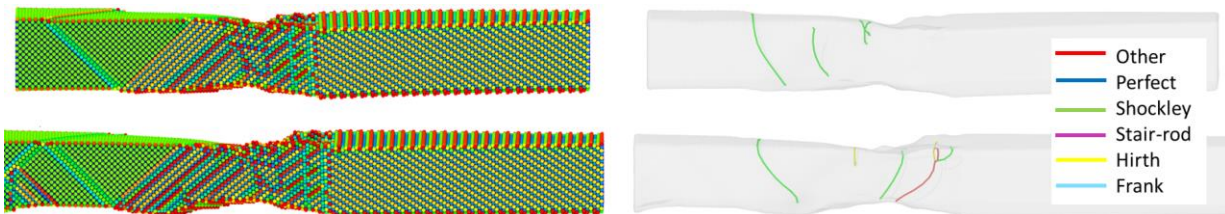


Division of Mechanics

Slip system activation in FCC copper under compression Master theses 30hp

The proposed Master project aims at investigating the mechanisms of shear deformation in the bulk of face centered cubic (FCC) single crystals based on molecular dynamics (MD). Simulation will be performed using the free software LAMMPS and 3 different crystallographic orientation will be modelled. In the first part of the Master thesis a MD model will be developed and a compression tests simulated for different orientations of the crystal. The obtained deformation patterns and the interaction between the shear planes will be examined through DXA analyses.



The second part of this work will focus on correlating the simulation results with experiments where single-crystalline specimen with 3 different crystallographic orientations of slip direction with regard to the applied load will be deformed in compression. Stresses necessary for the initiation and propagation of plastic deformation will be compared to the MD simulation results. Deformation patterns obtained in the simulations will also be directly compared to the traces of slip activity on polished specimen surfaces in the experimental findings.

The work is suitable for 2 students and can start in January 2021.

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