

# Behavior of triple junctions of grain boundaries during shear deformation in FCC metals

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In this work, we consider the nucleation of crystal lattice defects at the triple junction (TJ) of tilt grain boundaries (GBs) and plastic relaxation during shear deformation. The study is carried out using atomistic modeling [1] of a system with a size of 44.5x14.3x60 nm that consisting of three grains [2]. Aluminum [3] and copper [4] are considered as studied materials. The study shows that shear stresses increase in the vicinity of the TJ during shear deformation. Initially, this leads to the nucleation of dislocations in these regions. Then the nucleation of twins on the TJ occurs, which leads to a significant relaxation of shear stresses. When the TJ are formed from low-angle symmetric tilt GBs, the relaxation of shear stresses is mainly determined by their motion as a set of perfect edge dislocations [5]. This work is supported by the Russian Science Foundation, Project No. 20-11-20153.

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