

[PO-E1]Poster Session 1

Symposium E

Mon. Oct 29, 2018 5:45 PM - 8:00 PM Poster Hall

**[P1-28]Understanding Interactions of Dislocations with Interfaces in
Nickel-based Superalloys: Insights from Molecular Dynamics
Simulations**

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Nickel-base superalloys, as the favorite material for the turbine blade of the engines, have attracted a lot of attention due to their excellent creep properties and good microstructure stability. The evolution of dislocations during creep procedure and core structures of dislocations play an important role in the strengthening mechanism of nickel-base superalloys. Especially, the dislocation reactions and their interaction with γ/γ' interfaces of nickel-base superalloys contribute to a stable stage of creep. Here, based on developed mechanistic framework, we study the interactions of dislocations with interfaces to better understand the origin of ductility of nickel-base superalloys. Using atomistic reaction pathway calculations based nudged elastic band (NEB) method, we elucidate the slip transfer reaction mediated by interfaces of nickel-base superalloys. The findings offer new idea on the possible means to optimize the ductility and strength through interfacial engineering for nickel-base superalloys.