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Orientation effect on dislocation nucleation and related interaction during void growth simulations in Aluminum AMITAVA MOITRA, MEHUL BHATIA, KIRAN N. SOLANKI, Mississippi State University — Molecular dynamics simulations are performed to understand the void growth for fcc Aluminum. Dislocation nucleation at the void surface and growth of those dislocations in matrix, are studied for seven different crystallographic orientations: [100], [110], [111], [210], [211], [221], and [321]. A significant effect of the loading orientation on dislocation loop nucleation and configuration, and consequently the shape change of voids are found. Calculations related to the interaction of burgers vectors of the nearby leading and trailing dislocations are performed to find the reason why dislocation extremities are attached to the void surface. It has been also shown for a particular orientation that the extremities leave the void surface in order to reduce the interaction energy. Cross slip and triplanar loops are also found during the study of void growth simulations.

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