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Deformation Initiation by Non-planar {10-12} Twinning Nucleation in Magnesium Crystal SUNGHO KIM, HAITHAM KADIRI, MARK HORSTEMEYER, Mississippi State University — The nucleation mechanism of experimentally most commonly observed twinning in Mg crystal initiating deformation process are studied using molecular dynamic simulation. We observed nucleation of radially growing {10-12} twinning under tensile loading in Mg rectangular wire system without artificial creation of an twinning. The twinning nucleation mechanism is very different from the conventional twinning mechanism in that the twin nucleates from a point source rather than the fault plane following the partial dislocation line in FCC crystal. The wire axis is normal to basal plane of Mg crystal. The tensile deformation in c-axis nucleates {10-12} twinning starting at the corner of square of cross section of the wire. The twin boundary is spherical at the beginning and become linear boundaries in {10-12} planes as time goes by.

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