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Dislocation Drag at the Nanoscale

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Plasticity in nanocrystals is significantly altered by the presence of free surfaces, especially when the volume of material is small compared to the inherent dislocation structure size. In this talk, we look at how free surfaces directly affect the mobility of dislocations when they are free to glide. Molecular dynamics simulations show that the drag mechanisms are altered, resulting in higher drag forces, which exhibit a one-over-length scaling characteristic of localized surface forces.

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