Abstract Submitted
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Crystalline inclusion, tensile strain and shear bands in metallic glass nanowires[1] MATIAS SEPULVEDA-MACIAS, NICOLAS AMIGO, GONZALO GUTIERREZ, Departamento de Fisica, Facultad de Ciencias, Universidad de Chile — A molecular dynamics study of the effect of crystalline inclusions on the mechanical properties of metallic glass nanowires is presented. The system consists of a parallelepiped composed by a million atoms interacting by means of an embedded atom potential, where three different crystalline spheres of 2, 4 and 6 nm radii has been included. These systems have been submitted to uniaxial tensile test up to 25% of strain. We describe in detail the evolution of the shear band formation confirming that it begin at the interface between the inclusion and glass phase, growing in the direction of the applied tensile force. In contrast to the case of bulk material, in nanowires the inclusion does not play a significant role on the mechanical properties of the sample. Nevertheless, the inclusion plays a role in developing an interconnected network of loosely packed atom regions, which defines a particular medium range order in the sample.

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