Abstract Submitted
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Onset of plasticity and its relation to structure in CuZr metallic glasses: a molecular dynamics study[1] GONZALO GUTIERREZ, MATIAS SEPULVEDA, NICOLAS AMIGO, Departamento de Fisica, Facultad de Ciencias, Universidad de Chile — The plastic behavior of crystalline metals is well understood. It is known that this regime is mainly mediated by the nucleation and propagation of dislocations as well as by grain boundary sliding. In metallic glasses (MGs), the plastic behavior is quite different from their crystalline counterparts. It is well known that bulk metallic glasses, in addition to the high yield strength and a elastic deformation to a strain limit about 2 % (i.e., more than an order of magnitude greater than conventional crystalline metals), are brittle at room temperature. Interestingly, MG nanowires present an important degree of ductillity, and is an ideal system to study the onset of plasticity in MG. Here we present a computational tensile test which shows the evolution of the atomic structure of a $Cu_{50}Zr_{50}$ metallic glass nanowire at 300 K according to the applied strain increased. The system consists of a million atoms CuZr nanowire metallic glass. Local structure of atoms is analyzed by means of the Voronoi polyhedral technique and the nucleation and propagation of SBs by monitoring the atomic strain.

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