Computer Simulated Cold Welding of Metal Nanowires EDISON
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13083-970, Campinas - SP, Brazil — Metallic contacts are of great importance in
electronic devives, the ability of welding them without temperature change is quite
remarkable and of interest. Recently cold welding was achieved in gold and silver
nanowires (NWs) with diameters in the range of 4 to 10 nm [1]. In the present work
we use computer simulations to produce cold welding in gold, silver and silver-gold
NWs at room temperature. We used molecular dynamics with many body effective
potentials based on the embedded-atom method EAM using the LAMMPS code to
simulate first the braking of gold and silver NWs. The two produced NWs are then
cold welded and similarly as occurred in the experiments the newly welded NWs
showed fcc structures as the printine samples. The structural analysis is done with
two independent methods [2] and strain stress curves of the breaking and welding
are present. Our computer simulation compare very well with the experiments. This
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[2] E. Z. da Silva and Z.S. Pereira, Phys. Rev. B **81**, 195417 (2010).

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