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Magnetoconductance of molecularly linked Au nanoparticle arrays near the metal-insulator transition AL-AMIN DHIRANI, JEFF DUNFORD, Chemistry, University of Toronto, BRIAN STATT, Physics, University of Toronto — Magnetoconductance of 1,4-butanedithiol-linked Au nanoparticle films reveal features consistent with "weak localization" (coherent backscattering). Elastic, inelastic, and spin-orbit-scattering time scales extracted using a theoretical model are consistent with those found in other studies on granular Au films, and in particular, reveal that elastic-scattering time scales are comparable to those required for an electron to traverse a nanoparticle. The latter result is consistent with non-Arrhenius conductance vs temperature data. Together, the data suggest that scattering within clusters of molecularly linked nanoparticles plays a critical role in hopping-electron transport in films near a percolationdriven metal-insulator transition.

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