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Broadband Asymmetric Optical Reflectance of Chemically Grown, Near-Percolation Granular Silver Films MIRIAM DEUTSCH, University of Oregon, AIQING CHEN, UC Santa Cruz — Nanostructured thin metal films with controllable optical dispersions are highly relevant to areas such as optical coatings and photovoltaic devices. We address here the dispersive properties and high reflectance asymmetries observed in chemically grown nanocrystalline silver films. We show that while the optical transmittance of the films is always symmetric, as required by electromagnetic reciprocity conditions, their reflectance asymmetries may exceed those of vacuum deposited bulk films by as much as an order of magnitude. We present here an experimental study of a large number of composite structures comprised of both chemically and vacuum deposited silver films. We show how the optical reflectance asymmetry and its dispersion correlate with measured sheet resistances of these films, and demarcate a unique spectral crossover point of the reflectance asymmetry as an indication of the onset of charge percolation.

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