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**Plasmonic propagation along Metal/Semiconductor/Metal nanowires** LAETITIA BERNARD, MARLEEN H. VAN DER VEEN, DANIEL TURNER-EVANS, ERIC R. DUFRESNE, MARK A. REED, Faculty of Engineering, Yale University, KWAN SKINNER, SEAN WASHBURN, Department of Physics and Astronomy, University of North Carolina — Recent advances demonstrated metallic nanowires as structures allowing selective coupling of photons to fluctuations in the surface density of electrons, and the propagation of these plasmon modes along the wire. We report here the observation of such propagating plasmons in heterogeneous metal/semiconductor/metal nanowires. Specifically, we excite one end of a Au/CdSe/Au nanowire with focused laser light and demonstrate the coupling of photons into the plasmon modes of the wire. These modes propagate along the wire, being emitted as elastically scattered photons, exclusively at the metal/semiconductor interfaces and the distal end. Through control of the excitation wavelength and wire composition, we gain insights about the nature of the plasmon propagation through CdSe, allowing direct comparison with standard metal studies. This contributes to the growing interest in plasmonics within nanoscale devices by extending it to semiconductor materials, and goes towards the integration of optics with nanotechnology.

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