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Studies of Surface Exciton Polaritons in Nano-Materials by Electron Energy-Loss Spectroscopy. C.H. CHEN, Center for Condensed Matter Sciences, National Taiwan University, C.T. WU, Department of Materials Science and Engineering, National Taiwan University, M.W. CHU, L.C. CHEN, Center for Condensed Matter Sciences, National Taiwan University, C.W. CHEN, Department of Materials Science and Engineering, National Taiwan University, K.H. CHEN, Institute of Atomic and Molecular Sciences, Academia Sinica, Taiwan — Surface plasmon polaritons (SPPs), which normally occur in the optically *metallic* spectral regime, are collective charge density oscillations of conduction electrons at the surface of metals. In sharp contrast to SPPs, the excitations of surface exciton polaritons (SEPs), which are collective oscillations of delocalized excitons at the surface of semiconductors or insulators, have been shown to be correlated with distinct excitonic onsets (interband transitions) in these materials. Using electron energy-loss spectroscopy (EELS) with a 2-Å electron probe in the near-field geometry and energy-filtered spectral imaging in real space, we have unambiguously demonstrated the existence of the SEP excitations on the surfaces of GaN and ZnO nanorods at energies near the interband transitions.

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