Abstract Submitted
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Probing plasmons in three dimensions in a scanning transmission electron microscope[1] JORDAN HACHTEL, Vanderbilt University, ANAS MOUTI, Oak Ridge National Laboratory, DANIEL MAYO, CLAIRE MARVINNEY, Vanderbilt University, RICHARD MU, Fisk University, RICHARD HAGLUND, Vanderbilt University, STEPHEN PENNYCOOK, University of Tennessee, MATTHEW CHISHOLM, Oak Ridge National Laboratory, SOKRATES PANTELIDES, Vanderbilt University — The optical behavior of nanostructured materials is of significant interest across many fields. Surface plasmons and their interactions with emitters in nanoscale devices allow us to control light below the coherence limit. By understanding the nature of plasmonics at the local level we can move towards unlocking the full potential of photonic devices. To this end, we examine plasmonic Ag nanoparticles suspended on insulating nanowires by combining cathodoluminescence spectroscopy, electron energy loss spectroscopy, and high resolution annular dark field imaging in a scanning transmission electron microscope. The complementary nature of CL and EELS allow us to extract optical data from a randomly shaped and oriented nanoparticle, and understand its plasmonic behavior in all three spatial dimensions.

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