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Dark-field Spectroscopy of Plasmonic Nanodevices with Nanometer Scale Features DAVID FRENCH, STEPHEN BAUMAN, DESALEGN DEBU, CAMERON SAYLOR, JOSEPH HERZOG, University of Arkansas — Plasmonic nanodevices are metallic structures that exhibit plasmonic effects when exposed to light, causing scattering and enhancement of that light. These plasmons makes it possible for light to be focused below the diffraction limit. Dark-field spectroscopy has been used to capture scattering spectra of these structures in order to examine the scattering and resonant frequencies of the plasmons provided by the devices. Dark-field spectroscopy is particularly well suited to this task because it is inexpensive to set up and it functions well with low signals. This paper examines the relation between the geometries of the devices and the spectral intensity of the scattered light. We study geometric parameters including device thickness and adhesion layer effects. Additionally we plan to investigate nanostructures fabricated with novel fabrication technique with device dimensions that are below 10 nm, both gap width and structure width. These devices are modeled computationally as well as manufactured and characterized experimentally.

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