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Plasmonic thickness variation study of gold nanostructures in ultraviolet-visible light regime PIJUSH GHOSH, DESALEGN TADESSE DEBU, DAVID FRENCH, STEPHEN BAUMAN, JOSEPH B. HERZOG, Univ of Arkansas-Fayetteville — Noble metal nanostructures exhibit strong surface plasmon resonances in the ultraviolet-visible light range that are not present in bulk metal. In this study, we have observed the plasmonic properties of different sized gold nanodisks and nanorods with varying thickness. The samples were fabricated by electron beam lithography on silicon dioxide substrates. Depending on the thickness of the nanostructures, strong and well-defined surface plasmon resonances were found (wavelength 400nm - 1000nm). For experimental and theoretical results, we have used Dark field spectroscopy and finite element method, respectively. We found that resonance peak was shifted with nanostructure thickness. By using Dark field spectroscopy, the scattered light from individual structures can be analyzed with less background noise and the incident light was at an angle to the substrate.

Pijush Ghosh
Univ of Arkansas-Fayetteville

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