

Abstract Submitted
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Theory of plasmon-enhanced metal photoluminescence TIGRAN V. SHAHBAZYAN, Jackson State University — Metal photoluminescence (MPL) originates from radiative recombination of photoexcited core holes and conduction band electrons. In metal nanostructures, MPL is enhanced due to surface plasmon local field effect. We identify another essential process in plasmon-assisted MPL - excitation of Auger plasmons by core holes - that hinders MPL from small nanostructures. We develop a microscopic theory of plasmon-enhanced MPL that incorporates both plasmonic enhancement and suppression mechanisms and derive enhancement factor for MPL quantum efficiency. Our numerical calculations of MPL from Au nanoparticles are in excellent agreement with experiment.

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