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Surface plasmon enhancement of fluorescence on gold nanogratings STEPHANIE WIELE, Department of Physics and Astronomy, Trinity University, IURI GAGNIDZE, Department of Engineering Science, Trinity University, JENNIFER STEELE, Department of Physics and Astronomy, Trinity University —
This work focuses on using surface plasmons (SPs) excited on gold wire gratings to enhance the yield from fluorescent molecules. SPs enhance fluorescence by amplifying the electromagnetic near-field that excites the fluorophore as well as providing additional decay channels for the fluorphore. Although it has already been shown that SPs excited on metal nanoparticles can enhance fluorescence, SPs excited on gratings offer several advantages over nanoparticles. Because SPs are excited by the diffraction orders of the grating, changing the angle of incidence of light will change the SP wavelength. The SP excited on the grating can then be tuned on a single plasmonic substrate to overlap the absorption and emission spectrum of many different fluorophores. The ability to tune the SP wavelength through both the absorption and emission wavelength of the fluorophores on a single substrate will give greater insight to how SPs enhance fluorescence and how to maximize the fluorescence enhancement for various biosensing applications.

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