

Abstract Submitted
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Multiple-mode grating-coupled enhancement of fluorescence by gold nanowires IURI GAGNIDZE, JENNIFER STEELE, Trinity University — We demonstrate directional enhanced fluorescence emission from a gold wire grating. The dominant enhancement mechanism was shown to be excited fluorophores decaying into surface plasmon modes that radiate via the periodicity of the grating. The emission from fluorophores decaying in this way was strongly directional. The fluorophores efficiently coupled to multiple surface plasmon grating modes on both the top and substrate side of the grating, enhancing a broad spectrum of fluorescence wavelengths. This makes periodic systems more flexible than their nanoparticle counterparts. Coupling to multiple modes also allows gratings to enhance fluorescence at wavelengths smaller than the period of the grating, allowing gratings with micron and larger sized features to enhance fluorescence wavelengths in the visible range. This greatly loosens fabrication requirements for potential applications.

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