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**Ultra-Amplification of Surface Plasmon Coupled Emission in Graphene-Silver Hybrid Films** PRADYUMNA MULPUR, Sri Sathya Sai Institute of Higher Learning, India, KIRAN LINGAM, Dept. of Physics and Astronomy, Clemson University, S.K. VEMULA, S.S. RAMAMURTHY, V. SRINIVASAN, V. KAMISETTY, Sri Sathya Sai Institute of Higher Learning, India, APPARAO RAO, Dept. of Physics and Astronomy, Clemson University, CLEMSON UNIVERSITY TEAM, SRI SATHYA SAI INSTITUTE OF HIGHER LEARNING TEAM — Surface Plasmon Coupled Emission (SPCE) stems from an interaction between fluorophores and thin metallic films and leads to strongly directional $p$-polarized emission with signal intensities that are 10-1000 times greater than isotropic fluorescence emission. Conventional SPCE methods use silver thin films with a $SiO_2$ spacer layer to prevent oxidation of silver, and the latter has no role in the signal generation. Here we employ single- and bi- layer graphene (SLG-BLG) as the spacer layer and demonstrate a 10 fold enhancement in comparison to the isotropic fluorescence intensity for rhodamine B fluorophore doped in PVA matrix. A fiber optic spectrometer was used to record the emission which was strongly directional (at 50° relative to the incident excitation) and 97% $p$-polarized. Base on our preliminary simulations, we attribute the synergistic interaction between the $\pi$-plasmons of graphene and the surface plasmons of silver as the most important factor in the amplification of the SPCE.

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