

Abstract Submitted
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Enhancing Stimulated Emission based Fluorescence Detection with Interferometric Setup¹ FU-JEN KAO, National Yang-Ming University — Stimulated emission, being spatially coherent, supports unattenuated fluorescence detection at extended distance with low NA optics. We have demonstrated stimulated emission (SE) imaging in a long-working distance configuration. Additionally, the corresponding fluorescence lifetime imaging is realized by electronically controlling the time delay between the excitation and the SE pulses in the nanosecond ranges through pump-probe configuration. The fluorescence lifetime of selected fluorophores is accurately determined through the pump-probe configuration. However, the sensitivity of SE based fluorescence detection is usually limited by the dynamic range and saturation of photodetectors. We are showing that interferometric setup can greatly enhance the detection sensitivity by reducing the DC level of the stimulation beam with destructive interference. The results show that there are many interesting possibilities by combining interferometric techniques with stimulated emission based fluorescence detection.

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