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【559】Entangled two-photon absorption and the quantum advantage in sensing

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The recently developed theory of entangled two-photon absorption (ETPA) predicts a linear dependence of its rate on the entangled pair flux in the low-power regime, and provides a tool for two-photon studies even on sensitive samples. We experimentally observed this signature for ETPA-induced fluorescence of Rhodamine 6G and its dependence on inter-photon delay, concentration and polarization to find out which degrees of freedom play a role in ETPA. The developed methods have possible applications in sensing, spectroscopy, imaging and fluorescence microscopy, especially for biological objects in vivo, that could be susceptible to damage from intense laser schemes.

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