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Quantum plasmonic nano-imaging of few-layer MoS₂. DMITRI VORONINE, Texas AM University — Transition metal dichalcogenides such as MoS₂ are promising 2D materials with many applications. Their diffraction-limited optical characterization using Raman spectroscopy provides important structure-functional information. In this work, nanoscale tip-enhanced Raman scattering (TERS) signals of few-layer MoS₂ are presented and limits of signal enhancement are investigated by varying the tip-sample gap. Quantum plasmonic quenching of gold photoluminescence signals was observed for subnanometer gaps. Similar quantum plasmonic behavior was observed for more than 3 nm gaps between gold substrate and tip with few-layer MoS₂ junctions. These results may be used for designing new generation quantum optoelectronic devices.

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