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Molecular Spectroscopy Using Slow Surface Plasmon Polaritons

MICHAEL PREINER, KEN SHIMIZU, NAZANIN DAVANI, JASON FABBRI, NICHOLAS MELOSH, Stanford University — Surface plasmon polaritons have recently attracted interest for both fundamental science and device applications. In addition to the normal surface plasmon mode, in metal-insulator-metal junctions a slow mode exists that is of particular interest for studying molecular-scale junctions. Accessing the slow mode is of great utility for studying the properties of these junctions, as the field intensity of the slow mode can be thousands of times larger than that of the normal surface mode inside the junction. We have demonstrated the ability to optically couple into the slow modes of molecular junctions using short-period diffraction gratings, and will discuss applications of this technique.

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