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Plasmonic Hot Electron Induced Photocurrent Response at MoS_2-Metal Junctions TU HONG, Vanderbilt University, BHIM CHAMLAGAIN, Wayne State University, SHUREN HU, SHARON WEISS, Vanderbilt University, ZHIXIAN ZHOU, Wayne State University, YAQIONG XU, Vanderbilt University — We investigate the photocurrent generation mechanisms at few-layer MoS_2-metal junctions through wavelength- and polarization-dependent scanning photocurrent measurements. When laser energy is above the direct bandgap of MoS_2, the maximum photocurrent response is observed when incident laser polarization direction is parallel to the metal electrode due to photovoltaic effect. On the contrary, when illuminated by laser with energy below the direct bandgap of MoS_2, the strongest photocurrent response occurs when incident laser is polarized perpendicular to the metal electrode. Further studies demonstrate that light absorption by the plasmonic metal electrode is polarization-dependent, which creates hot electron-hole pairs and subsequently inject into MoS_2. These studies shed light on future design rules of two-dimensional material based optoelectronic devices through surface plasmon resonances.

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