

Abstract Submitted
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Excitation of plasmons in metallic nanostructures by hot electrons in an adjacent semiconductor JIANTAO KONG, CHAOBIN YANG, JUAN MERLO, MICHAEL J. BURNS, MICHAEL J. NAUGHTON, KRZYSZTOF KEMPA, Boston Coll — It has been shown in a simple model calculation that hot electrons excited in a semiconductor can emit plasmons in an adjacent metallic nanostructure at a very high rate, exceeding that of phonon emission [1]. This effect could provide a possible route to high photovoltaic energy conversion efficiency in a hot electron solar cell. Here, we study this process in specific nanostructures, toward maximizing the effect. In theoretical work, we employ the high fidelity, finite difference time domain (FDTD) simulation technique to study the optical response of the systems considered, combined with quantum mechanical calculation of the scattering rates. We will also discuss fabrication and near and far-field optical measurements of test samples.

[1] K. Kempa, *Phys. Status Solidi RRL* **7**, 465 (2013).

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