Femtosecond Carrier Dynamics in Gold-MoS$_2$ Hybrid Nanostructures CHLOE DOIRON, XUEJUN LIU, HOSSEIN ROBATJAZI, ISABEL THOMANN, Department of Electrical and Computer Engineering, Rice University — Small plasmonic nanoparticles are known to efficiently generate energetic hot carriers [1] that can be harnessed by injecting them across a Schottky barrier. To understand the role of plasmon-induced hot carrier generation across Schottky junctions in photocatalytic processes, we synthesized quasi-2D MoS$_2$ monolayer flakes decorated with Au nanoparticles in ethanol. Our goal is to study ultrafast plasmon induced electron injection from Au nanospheres into MoS$_2$ monolayer flakes. We will present femtosecond transient absorption measurements on MoS$_2$/Au hybrid nanoparticles in ethanol solvent, and compare them with neat MoS$_2$ flakes in ethanol.


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