Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

**Plasmonic enhanced Photoluminescence and absorption in MoS2 single layers** ADNEN MLAYAH, CEMES-CNRS-Paul Sabatier University, Toulouse, SINA NAJMAEI, Department of Mechanical Engineering & Materials Science, Rice University, Houston, INES ABID, CEMES-CNRS-Paul Sabatier University, Toulouse, ARNAUD ARBOUET, CHRISTIAN GIRARD, CEMES-CNRS, Toulouse, JEAN LÉOTIN, LNCMI-CNRS, Toulouse, JUN LOU, Department of Mechanical Engineering & Materials Science, Rice University, Houston — We report the successful transfer of CVD grown MoS2 to Au antenna fabricated using e-beam lithography, and we investigate the photoluminescence properties of this hybrid plasmonic-excitonic system. The work is focused on the plasmonic mediated pumping of the MoS2 photoluminescence emission. Off- and in-resonance excitation of the surface plasmons showed drastically different behaviors of the photoluminescence emission from the MoS2. For plasmonically mediated pumping, we found a significant enhancement of the photoluminescence intensity, emission peak broadening and red-shift. Based on numerical simulations of the plasmonic properties of the Au antenna, combined with heat dissipation calculations, we found that the results can be interpreted in terms of efficient light absorption by the plasmonic antenna and conversion into electron-hole pair excitations of the 2D MoS2 layer thus producing a photo-induced heating.

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Date submitted: 13 Nov 2014 Electronic form version 1.4