Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Graphene protected surface state on Ir(111) with adsorbed lithium PREDRAG LAZIC, Institute Ruder Bokovic, PETAR PERVAN, MARIN PETROVIC, IVA SRUT-RAKIC, Institute of Physics, Zagreb, IVO PLETIKOSIC, Brookhaven National Laboratory, MARKO KRALJ, MILORAD MILUN, Institute of Physics, Zagreb, TONICA VALLA, Brookhaven National Laboratory — It is well known that electronic surface states (SS) get strongly perturbed upon the chemical adsorption of very small amount of adsorbates. Adsorption of lithium atoms on Ir(111) is no exception to that rule. Iridium SS gets strongly perturbed and is practically eradicated - it can not be seen as a sharp peak in the ARPES measurement. However, if the system is prepared with graphene on top of Ir/Li system, the iridium SS reappears. We present a combined experimental and theoretical study of the described system. Using the density functional theory calculations for large unit cells with disordered lithium atoms geometries on the (111) surface of iridium we were able to reproduce the results of the ARPES measurements - showing clearly that the SS signal is strongly suppressed when lithium is adsorbed, while it is almost unchanged when lithium is intercalated (i.e. with graphene on top of it). Looking at the projected density of states we constructed a rather simple model explaining this behavior which seems to be general.

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Date submitted: 06 Nov 2015 Electronic form version 1.4