

Abstract Submitted  
for the MAR11 Meeting of  
The American Physical Society

**Hybridization wave as the “Hidden Order” in URu<sub>2</sub>Si<sub>2</sub>**<sup>1</sup> JONATAN DUBI, ALEXANDER BALATSKY, Los Alamos National Lab — A phenomenological model for the hidden order transition in the heavy Fermion material URu<sub>2</sub>Si<sub>2</sub> is introduced. The model assumes an incommensurate, momentum-carrying hybridization between the light hole band and the heavy electron band, appearing after a Fano hybridization takes place. The hybridization wave is identified as the “Hidden Order” order parameter. The model, simplified to one dimension, qualitatively reproduces numerous experimental results obtained from e.g. neutron scattering and scanning tunneling microscopy, and mainly the gap-like features in the density of states and the appearance of features at an incommensurate vector  $Q^* \sim 0.6\pi/a_0$ . Finally, the model allows us to make various predictions which are amenable to current experiments.

<sup>1</sup>This work was supported by LDRD and in part, by grant No. DE-AC52-06NA25396 and UCOP-TR-01.

Jonatan Dubi  
Los Alamos National Lab

Date submitted: 28 Dec 2010

Electronic form version 1.4