Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Mott transition in the coupled quantum wells with the external periodic potential OLEG BERMAN, ROMAN KEZERASHVILI, New York City College of Technology of CUNY, Brooklyn NY, USA, YURII LOZOVIK, Institute of Spectroscopy, Troitsk, Russia, KLAUS ZIEGLER, University of Augsburg, Augsburg, Germany — We study a system of spatially separated electrons and holes in two coupled quantum wells within a temperature-dependent mean-field approach. A periodic potential is applied to the quantum wells which allows us to modify the spectral properties of the electrons and the holes. This system exhibits a rich phase diagram, consisting of a BCS phase with electron-hole pairs, an electron-hole plasma and a bosonic Mott phase of tightly bound electron-hole pairs. The latter have no phase coherence in contrast to the pairs in the BCS phase. We discuss the transitions between the different phases in terms of temperature, density and interaction strength.

Oleg Berman
New York City College of Technology of CUNY, Brooklyn NY

Date submitted: 14 Nov 2014 Electronic form version 1.4