Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Exciton-Polaritons condensates with flat bands in a two-dimensional kagome lattice NA YOUNG KIM, Stanford University, NAOYUKI MASUMOTO, National Institute of Informatics, YOSHIHISA YAMAMOTO, Stanford University, SVEN HOEFLING, ALFRED FORCHEL, University of Wuerzburg
— Microcavity exciton-polariton condensates have provided immense opportunity to investigating hydrodynamic vortex properties, superfluidity, and low energy quantum state dynamics. Recently, exciton-condensates have been trapped in various artificial periodic potential geometries: one-dimensional, two-dimensional (2D) square, triangular, and hexagonal lattices. A 2D kagome lattice has been of interest for many decades, which exhibits spin frustration, giving rise to magnetic phase order in real materials. In particular, flat bands in the 2D kagome lattice are physically interesting in that localized states in the real space are formed. Here, we realize exciton-polariton condensates in a 2D kagome lattice potential and examine their photoluminescence properties. Above quantum degeneracy threshold values, we observe meta-stable condensation in high-energy bands; the third band exhibits a signature of weaker dispersive band structures, flat band. We perform single-particle band structure calculation to compare measured band structures.

Na Young Kim
Stanford University

Date submitted: 27 Nov 2012 Electronic form version 1.4