Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Numerical Study of the Bose-Einstein Condensation of Exciton-Polaritons ASLAN KASIMOV, JESUS SIERRA, King Abdullah University of Science and Technology, RADA-MARIA WEISHÄUPL, Vienna University — Using the complex Gross-Pitaevskii equation (cGPE) with pumping and decay terms that models the Bose-Einstein condensate of exciton-polaritons, we numerically investigate the dynamics of instability of its radially symmetric steady solutions. We develop accurate algorithms for computing the steady state solution, the linear stability spectra, as well as the full nonlinear solutions of the cGPE. We accurately compute the thresholds of instability that depend, e.g. on the strength and size of the polariton pumping spot and observe the formation of vortices and such complex dynamics as the formation of vortex lattices and nucleation.

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Date submitted: 08 Dec 2011 Electronic form version 1.4