Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Many-body physics of intersubband polaritons LUC NGUYEN-THÊ, Laboratoire MPQ, Université Paris Diderot, France, SIMONE DE LIBERATO, University of Southampton, UK, MOTOAKI BAMBA, Osaka University, Japan, CRISTIANO CIUTI, Laboratoire MPQ, Université Paris Diderot, France
— Intersubband polaritons are light-matter excitations originating from the strong coupling between an intersubband quantum well electronic transition and a microcavity photon mode. Up to now intersubband polaritons have been observed in a wide range of the electromagnetic spectrum from the mid-infrared to the THz regime. Due to their composite bosonic nature, the matter part of these excitations is responsible for a non-trivial dynamics of cavity polaritons. We studied how the Coulomb electron-electron interaction and the Pauli saturation of the electronic transitions affect the many-body physics of intersubband polaritons [1]. As a first application we calculated the efficiency of intersubband polariton-polariton scattering, paving the way to promising quantum non-linear optics especially in the THz regime.

[1] L. Nguyen-Thê, S. De Liberato, M. Bamba, C. Ciuti, submitted.

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Date submitted: 27 Nov 2012 Electronic form version 1.4