

Observation of BEC-related phenomena in polariton condensates

Daniele Sanvitto

Departamento de Física de Materiales, Universidad Autónoma de Madrid, Madrid 28049,
Spain

Tel: +34914976887, email: daniele.sanvitto@uam.es

Abstract:

Exciton-polaritons are quasi-particles formed in semiconductors microcavities under strong light-matter coupling obtained by making use of an intense optical cavity field in resonance with the exciton transition of a Quantum Well. Polaritons have shown very interesting properties such as χ^3 non-linearities [1], peculiar spin dynamics [2], and recently Bose Einstein condensation [3], all given by the extremely peculiar dispersion relation, which happens to be fully accessible experimentally by angular and energy resolved spectroscopy.

In this talk we will review the experimental achievements and the characteristics of a condensate of exciton-polaritons under non-resonant and resonant excitation and show the recent observation of superfluid behaviour manifested as frictionless motion [4,5], splitting with no scattering and permanent circulation in presence of vortex states [6].

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