

# Propagation of polariton wavepackets

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We discuss the propagation of coherent polariton wavepackets in the two-dimensional plane of a semiconductor microcavity, in the presence of a continuous coherent pumping, finite photon lifetime, dissipation and potential fluctuations. Interpreting the wavepacket as a condensate wavefunction, this work addresses the topical issue of polaritons Bose-condensates [1].

We pay special attention to the case where nonlinearities arising from point-like particle-particle interactions dominate the system, especially in configurations where strong parametric oscillations occur from a highly populated state that scatters off particles into phase-matched so-called signal and idler states [2].

We discuss the coherent properties of the polariton field, evoking its vorticity [3], its superfluid velocity, its interactions with defects, long-lived propagation of shape-preserving, soliton-like excitations, and propose a tentative picture of the phenomena recently observed in time-resolved pump-probe experiment [4].

- [1] Le Si Dang, D. Snoke, B. Deveaud, J. J. Baumberg, J. Bloch, invited contributions at this conference.
- [2] M. Wouters, invited contribution at this conference.
- [3] Yu. Rubo, invited contribution at this conference.
- [4] D. Sanvitto, invited contribution at this conference.

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