

Disorder stabilized topological defects in polariton condensates

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Polariton condensates may be created both spontaneously through a standard phase transition towards a Bose Einstein condensate, or be resonantly driven with a well-defined initial phase, speed and spatial distribution.

Thanks to the photonic component of polaritons, the properties of the quantum fluid may be accessed very directly with in particular the possibility of detailed interferometric studies. This allows for example to probe the long-range coherence properties of a quantum fluid with unprecedented ease. This also allows testing superfluidity with great precision.

Here, I will describe the static and dynamics of vortices, obtained with a picosecond time resolution, in different configurations, with in particular their phase configuration. I will show in particular the dynamics of spontaneous creation of a vortex as well as the dissociation of a full vortex into two half vortices. I will also highlight the observation of spin vortices at particular locations in the sample.

This work has been performed at EPFL by a dream team of Postdocs, PhD students and collaborators: K. Lagoudakis, G. Nardin, T. Paraiso, G. Grosso, F. Manni, N. Takemura, M. Richard, A. Baas, Y Léger, S. Trebaol, M. Portella Oberli, F. Morier-Genoud and the help of our theorists friends V, Savona, M. Wouters and T. Liew. The CdTe sample that we have been using has been prepared by Regis André at the University of Grenoble, and we strongly benefited from the long time collaboration with the group of Le Si Dang.