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Quantum features in the hydrodynamic flow of a superfluid of light

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After a number of experiments showing the power of fluids of light in semiconductor microcavity devices for superfluid hydrodynamic studies, a growing activity is being devoted to *quantum* hydrodynamic features, where hydrodynamic quantities such as density, current, etc. must be described by quantum operators. As a concrete example, we shall consider the emission of phonon pairs from a sonic horizon via analog Hawking radiation processes. The robustness of entanglement against the driven-dissipative nature of the microcavity photon fluid will be discussed and perspectives to detect it will be sketched. In the last part, I will discuss the potential of a different, propagating architecture in view of studies of the conservative quantum dynamics of a photon fluid. After a brief summary of the general theoretical framework, our attention will be focused to a slab geometry able to exploit the power of quantum fluids of light to study the physics of quantum quenches.