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# Creation, dynamics and interactions of solitonic vortices in elongated BECs

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## Abstract

I will report on the experimental observation of solitonic vortices in an elongated Bose-Einstein condensate. A rapid quench across the BEC transition induces the spontaneous creation of defects (most likely solitons) in the phase of the resulting condensate [1], following the Kibble-Zurek mechanism. A probable evolution mechanism of such solitons consists in their decay, due to snake instability, first to vortex rings and finally to vortex lines mainly oriented in the radial plane of the elongated BEC. We study the properties of these stable topological defects, also known as solitonic vortices, by imaging them from three orthogonal directions and through interferometric techniques [1,2]. A stroboscopic method allows us to make a real-time imaging of the vortex orbiting in the BEC. We detect the variation of the orbital period due to the atom number reduction on the long term as well as effects due to the interaction among crossing vortices. [1] G. Lamporesi et al., Nat. Phys 9, 656 (2013)  
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