
Vortex molecules, rotons and stripes in coherently coupled spinor BECs

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Abstract

I will present recent theoretical advances in the study of coherently coupled BECs. These include :

- i) The formation of vortex molecules in Rabi coupled BEC gases with the emergence of confinement and precession phenomena, resulting from the competition between the surface tension associated with the domain wall connecting pairs of vortices and the repulsive effect caused by the interaction.
- ii) The interplay between the roton excitation and the formation of stripes in interacting spin-orbit coupled BECs in both $s=1/2$ and $s=1$ spinor gases. I will also discuss the highly non linear behavior of the gas and the formation of stripes in the presence of a static periodic potential with wave vector close to the roton minimum.

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