THEORETICAL PHYSICS SEMINAR

Title: Excitation spectrum and dispersion relation of binary condensates in quasi-2D optical lattices

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Date/Time/Venue: 22nd July (Wednesday)/4:00 PM/ Room No. 469

ABSTRACT

In this talk, we explore the collective excitations of two-species Bose-Einstein condensates (TBECs) loaded into two-dimensional optical lattices. We develop the Hartree-Fock-Bogoliubov theory with the Popov approximation using the coupled discrete nonlinear Schrodinger equations to analyze the quasiparticle mode evolution of TBEC. We observe the transition from miscible to the immiscible (phase-separated) ground state density profile upon varying the intraspecies (interspecies) interaction for 87Rb-85Rb (133Cs-87Rb) TBEC. At phase separation, the degenerate slosh mode goes soft and gets transformed into an interface mode. This mode regains energy upon further change in the interaction strength. We shall also discuss the character of the excitations using dispersion relation of TBEC in harmonically trapped optical lattices.

All are welcome to attend