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Strongly Interacting Quantum gases using spin-Coherent state Representation RADHA BALAKRISHNAN, Institute of Mathematical Sciences, Chennai, India, INDUBALA SATIJA, George Mason University, Fairfax, VA — For strongly interacting boson gas, spin-coherent states representation may provide a useful description of the Bose-Einstein Condensate as it encodes fluctuations and depletion. We investigate the non-linear evolution equation for the order parameter obtained using spin-coherent states. The equation is not of the GPE-type and exhibits local fluctuations and in the limit of small order parameter, it reduces to the GPE equation. We compare and contrast the quasi-particle excitation and the vortex excitations of this system with that of weakly interacting quantum gas described by GPE equation. For a variety of problems, implication of this description of quantum gases will be discussed.

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