

Spin squeezing and entanglement quantification in atomic gases

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I will present some recent results on entanglement detection and quantification with collective spin measurements in many-body ensembles. After a brief review of the idea of “Spin Squeezing” and its relation with multipartite entanglement [1][2][3][4][5], I will focus on the quantification of entanglement by means of entanglement monotones with spin squeezing methods [6]. I will consider broad families of entanglement criteria that are based on variances of arbitrary operators and analytically derive the lower bounds these criteria provide for two relevant entanglement measures: the best separable approximation (BSA) and the generalized robustness (GR). As a concrete application, I will show the results of applying this method with experimental data of a spin-squeezed Bose-Einstein condensate of ~ 500 atoms.

References

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