

Distributed quantum sensing with networks of entangled atomic ensembles

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The noise performance of atomic sensor networks can improve with non-local entanglement protocols. Here we show how a modified quantum non-demolition spin squeezing protocol improves two node atomic clock and atomic interferometer networks [1]. These protocols can be directly applied to recently demonstrated gravity gradient atomic interferometer configurations. Applications of such networks range from satellite geodesy to gravitational wave and ultra-light dark matter detection. We will discuss recent work to extend these methods to atomic Sr.

References

- [1] BK Malia, Y Wu, J Martinez-Rincón, M Kasevich, Distributed quantum sensing with networks of entangled atomic ensembles, *Nature*, 612, 2022.