

Topic: Interferometry 2.0 - Entanglement

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Abstract:

In the last decades, advances in the level of precision in controlling atomic and optical systems opened up the possibility of exploiting the quantum mechanical properties of such systems for precision sensing applications. Atomic clocks and atom interferometers today are the most sensitive instruments for keeping time, measuring gravity or accelerations, and probing fundamental physical phenomena. New developments are enabling integration of quantum entanglement into these devices to further improve the precision.

In this talk I will focus on the description, implementations, and applications of a specific set of entangled states called spin squeezed states. I will give a brief historical overview, detailing some recent experiments demonstrating large amounts of squeezing, and implementations in atomic clocks. I will finish with discussing the quest to gainfully utilizing squeezed states for atom interferometric inertial sensors.