Multiparameter estimation with an array of entangled atomic sensors

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Quantum enhanced multiparameter sensing is receiving great attention for its applications to vector sensing, imaging, sensor arrays, and clock networks. While for single parameter sensing, a clear theoretical framework has been developed[1], multiparameter sensing is surprisingly complex from a conceptual point of view[2, 3].

In this poster I will present our proof-of-principle experiment in multiparameter quantum enhanced sensing with a spatially separated array of entangled 87Rb atomic sensors[4]. I will also discuss how our protocol[5] extends to optimally enhance an arbitrary array of entangled sensors, and demonstrate results of some optimal sensing schemes for specific tasks.

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