
Optimal thermometry: when the size matters

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Abstract

Here I will discuss fundamental limitations on the temperature estimation of a given sample as settled by quantum metrology. Which is the most precise thermometer to measure the unknown temperature of a sample? Is thermalization a needed requirement for optimal thermometry? Are such thermometers optimal to estimate the temperature of ultracold atomic lattice gases? Can we use correlations for such a goal? These and other questions, with implications in ultracold physics will be addressed here.

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