

Quantum Metrology vs. Quantum Enhanced Measurements

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Abstract

For quantum physicists Quantum Metrology means high-resolution and highly sensitive measurements of physical parameters strictly exploiting “pure-quantum” features, such as, e.g., quantum entanglement and/or quantum squeezing.

For metrologists Quantum Metrology represents the novel field of metrology developing measurement techniques necessary for the quality assurance, standardisation and market success of quantum technologies. These measurement techniques are not limited to measurements of enhanced precision by exploitation of “pure quantum” features. Quantum metrology also contributes to the revised International System of Units (SI) based on specific quantum effects allowing the “mise-en-pratique” of units directly from the fundamental constants. This talk will discuss "quantum metrology" from the perspective of metrologists, and from the one of quantum physicists, presenting some paradigmatic examples of the two approaches based on photons.