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【432】 High-mass matter-wave interferometry and quantum-assisted metrology

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Vienna's Long-Baseline Universal Matter-wave Interferometer (LUMI) has successfully demonstrated interference of massive molecules consisting of up to 2000 atoms and with masses up to 28.000 amu. LUMI's high force sensitivity of 10^{-26} N has also been used to sense electronic, optical, magnetic and structural properties of a very diverse class of particles. For example, measuring the diamagnetic susceptibility of barium and strontium or the polarizability of fullerenes with improved accuracy to previous measurements. Most recently we have used a magnetic gradient field to measure interferometrically the phase shifts of cesium and rubidium atoms according to their hyperfine structure.

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