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【574】 Fluorescence detection of the position and variance operators.

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We develop an optical technique to perform the quantum state tomography of a dipolar scatterer's state of motion. We approach this problem by experimenting with trapped ions and trapped silica nanoparticle as levitated dipolar scatterers. By manipulating the light emitted by the scatterers, we aim to measure the position and the variance operators of the scatterer's state of motion. This will allow us to identify quantum states of motion such as superposition of Fock states, squeezed states or cat states, in a full-optical manner.

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