Abstract Submitted
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Probing Aton-Atom correlations by Single Atom Detection[1] R. BUECKER, A. PERRIN, ST. MANZ, I. MAZETS, T. SCHUMM, J. SCHMIEDMAYER, Atominstitut, TU-Wien — We built a single atom camera that allows imaging of ultra cold quantum gases in expansion (R. Bücker, et al. NJP, **11,** 103039 (2009)). After release from a confining potential, atoms fall through a sheet of resonant excitation laser light and the emitted fluorescence photons are imaged onto an amplified CCD camera using a high numerical aperture optical system. The imaging system reaches an extraordinary dynamic range, not attainable with conventional absorption imaging. We demonstrate single-atom detection for dilute atomic clouds with high efficiency where at the same time dense Bose-Einstein condensates can be imaged without saturation or distortionIn the talk we will give examples of how these detectors can be used to probe atom-atom correlations in ultra cold degenerate quantum many body systems.

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