Abstract Submitted
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Resolving and addressing independent Bose-Einstein condensates (BECs) in individual sites of a CO_2 laser optical lattice EVA BOOKJANS, CHRIS D. HAMLEY, Georiga Institute of Technology, PEYMAN AHMADI, MIT, MICHAEL S. CHAPMAN, Georiga Institute of Technology — We realize the production of an array of 10-30 independent ^{87}Rb spin-1 BECs in the standing wave potential of a CO_2 laser by extending the single focus trap geometry of our all-optical BEC to a one-dimensional lattice. The period of the optical lattice created by the CO_2 laser is 5.3μm and is therefore large enough to optically resolve the individual sites and to selectively address them. By applying a high magnetic field gradient, we are able to manipulate single sites using microwave transitions between the different hyperfine states. We will present our experimental data together with theoretical simulations and discuss applications to studies of small condensates and their interactions.

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