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**Low-momentum Bragg Spectroscopy of a Strongly Interacting  $^{85}\text{Rb}$  Bose-Einstein Condensate** JUAN PINO, ROB WILD, JILA, DEBORAH JIN, ERIC CORNELL, JILA / NIST / University of Colorado — Bragg spectroscopy of a weakly interacting Bose-Einstein condensate (BEC) in the low-k limit has shown phonon-like dispersion (J. Steinhauer *et al.*, PRL **88**, 120407 (2002)). We report on Bragg spectroscopy of a strongly interacting BEC where we expect a divergence from the Bogoliubov spectrum (S. Papp *et al.*, PRL **101**, 135301 (2008)). We access the strongly interacting regime via a magnetic-field Feshbach resonance. Recent efforts focus on low-momentum excitations, and for this work we have implemented a shot-noise limited photon detection scheme. Additionally, we are working with a new, spherical trap that will allow us to interrogate the atoms in the strongly interacting regime for longer times than was possible in our previous work.

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