Abstract Submitted
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Quantum degenerate mixtures of Cs and Yb. KALI WILSON, ALEXANDER GUTTRIDGE, JACK SEGAL, SIMON CORNISH, Durham University — We have created quantum degenerate Bose-Bose mixtures of Cs + ^{174}Yb and Cs + ^{170}Yb in a bichromatic optical dipole trap. By tuning the interaction strength of Cs using a low-field Feshbach resonance we explore the stability of the Cs + ^{174}Yb degenerate mixture and observe collapse of the Cs condensate due to the interaction with ^{174}Yb. These results build upon recent interspecies thermalization and two-photon photoassociation measurements, which allowed more accurate calculation of the interspecies scattering lengths for all seven Yb isotopes, and identification of experimentally-feasible Feshbach resonances for magnetoassociation of CsYb molecules. We will report on recent progress from the Durham CsYb experiment including the demonstration of dual-degenerate Bose-Bose mixtures, observation of a Cs + ^{173}Yb interspecies Feshbach resonance, and the implementation of Cs-blind optical potentials. We will discuss prospects for exploiting the unique advantages of Cs-Yb mixtures for studies of beyond-mean-field physics, including mass-imbalanced quantum liquid droplets where quantum fluctuations stabilize against mean-field collapse.

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