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Efimov studies of an ultracold cloud of ^{39}K atoms in microgravity: Numerical modelling and experimental design MAREN MOSSMAN, PETER ENGELS, Washington State University, JOSE D'INCAO, DEBORAH JIN, ERIC CORNELL, JILA, NIST and University of Colorado, Boulder — Ultracold atomic gases at or near quantum degeneracy provide a powerful tool for the investigation of few-body physics. A particularly intriguing few-body phenomenon is the existence of Efimov trimer states at large interatomic scattering lengths. These trimers are predicted to exhibit universal geometric scaling relations, but in practice the situation is complicated e.g. by finite-range and finite-temperature effects. While some Efimov trimers have already been experimentally observed by several groups in ground-based experiments, NASAs Cold Atom Laboratory (CAL) onboard the ISS will greatly enhance the experimentally accessible regimes by providing ultracold clouds of ^{39}K atoms with temperatures at or below 1 nK, low densities, and long observation times. We present results of numerical modelling and simulations that lay out Efimov experiments capitalizing on the particular strengths of CAL.

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