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Theoretical studies of Efimov states and dynamics in quenched unitary Bose gases JOSE P D'INCAO, JILA, NIST and Department of Physics University of Colorado, Boulder CO , JIA WANG, Centre for Quantum and Optical Science, Swinburne University of Technology, Melbourne, Australia, CATHY KLAUSS, XIN XIE, DEBORAH S JIN, ERIC A CORNELL, JILA, NIST and Department of Physics University of Colorado, Boulder CO — We study the three-body physics relevant for quenched unitary Bose gas experiments [1] in order to determine the role of Efimov states on the dynamics of the atomic and molecular populations. Initially, the interatomic interactions are quenched from weak to infinitely strong. After some dwelling time, the interactions are slowly ramped back to some final weak value where a mixture of atoms, dimers, and Efimov trimers can exist and whose populations depend strongly on the dwell time. We model the problem using the adiabatic hyperspherical representation for three atoms assuming a local interaction model in which a harmonic potential mimics finite density effects. We also developed a novel Slow Variable Discretization (SVD) method to accurately determine the time evolution of the system, overcoming the difficulty of implementing diabatization schemes to minimize unwanted effects due to sharp-avoid crossings. This method also allows us to account for three-body losses during the time evolution. This research is supported by the U. S. National Science Foundation. [1] P. Makotyn, C. E. Klauss, D. L. Goldberger, E. A. Cornell, and D. S. Jin, Nat. Phys. 10, 116119 (2014).

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