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Shell-Geometry Bose-Einstein Condensates in Microgravity¹ RYAN CAROLLO, MAXWELL GOLD, XIAOLE JIANG, Bates College, KARMELA PADAVIC, SMITHA VISHVESHWARA, University of Illinois at Urbana-Champaign, COURTNEY LANNERT, Smith College, DAVID AVELINE, Jet Propulsion Laboratory, NATHAN LUNDBLAD, Bates College — NASA's Cold Atom Laboratory (CAL) provides investigators the unique capability of producing BECs in orbit, where the perpetual freefall environment enables experiments largely free of gravitational perturbation. We use this environment to study radiofrequencydressed condensates in a spherical or ellipsoidal shell (a "bubble"), a geometry that is technically difficult to achieve on Earth. We discuss initial results, operating procedures related to expansion adiabaticity and radiofrequency ramps, trap inhomogeneity, and possible mitigating techniques permitting a topologically-connected shell condensate.

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