Expansion of spherical shell condensates

SMITHA VISHVESHWARA, TZU-CHIEH WEI, University of Illinois at Urbana-Champaign, Urbana, Illinois 61801, COURTNEY LANNERT, Wellesley College, Wellesley, Massachusetts 02481 — Bose-condensed atoms in traps of novel geometries can show dramatic features in time-of-flight measurements that are absent in conventional spherical trap settings. The specific case of a trap creating a spherical condensate shell is presented. The dynamics of such a shell can yield a significant accumulation of mass at the center upon release of the trapping potential. Moreover, the expanded cloud can undergo self-interference and exhibit the associated interference fringes. These features are substantiated by numerical simulations and studied for a range of interaction strength between constituent atoms.