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Time Evolution of Freely Expanded Bose-Einstein Condensates Containing Small Numbers of Atoms DIAN-JIUN HAN, DE-SHENG HONG, K.H. HUANG, National Chung Cheng University, TSIN-FU JIANG, National Chiao-Tung University — We investigate the time evolution of freely expanded Bose-Einstein condensates by measuring their aspect ratios at different times after releasing from a magnetic trap. In these measurements, the condensates contain no more than 9000 ^{87}Rb atoms. By varying the trapping frequency and atom number, we measure the condensate aspect ratios at different expansion times in free space. We compare our measurements with that calculated from the Thomas-Fermi model and a direct numerical solution. Under our trapping condition, the data of the time dependent aspect ratios of the freely expanded condensates reasonably agree with the numerical calculations, but show clear deviation from the predictions by the Thomas-Fermi model when the atom number in the condensates is small.

Dian-Jiun Han
National Chung Cheng University

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