

Abstract Submitted  
for the MAR05 Meeting of  
The American Physical Society

**Density profiles for atomic quantum Hall states** FRANK VAN LANKVELT, Rudolf Peierls Centre for Theoretical Physics, Oxford, NIGEL COOPER, Cavendish Laboratory, Cambridge, JASPER REIJNDERS, KAREL-JAN SCHOUTENS, Institute for Theoretical Physics, University of Amsterdam — Among the fascinating developments in the field of quantum gases is the possibility to study correlated states of matter in a setting that is entirely different from the traditional setting of electrons in a solid state environment. A prime example are fractional quantum Hall (qH) states, which are expected when trapped atoms are made to rotate at ultra-high angular momentum. The most direct experimental signature of electronic (fractional) qH states, the quantization of the Hall conductance, is not easily available for realizations of such states with neutral atoms. Therefore, we need to find other signatures that arise from their presence. We will show what effect these states have on the density in a variety of regimes and in particular discuss the fate of (weakly) coupled layers of rotating Bose gases.

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Date submitted: 01 Dec 2004

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