Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Poisson's Spot with Molecules[1] THOMAS REISINGER, University of Bergen, Norway, AMIL PATEL, Massachusetts Institute of Technology, USA, HERBERT REINGRUBER, KATRIN FLADISCHER, WOLFGANG E. ERNST, Graz University of Technology, Austria, GIANANGELO BRACCO, University of Genova, Italy, HENRY I. SMITH, Massachusetts Institute of Technology, USA, BODIL HOLST, University of Bergen, Norway — In the Poisson-Spot experiment, waves emanating from a source are blocked by a circular obstacle. Due to their positive on-axis interference an image of the source (the Poisson spot) is observed within the geometrical shadow of the obstacle. The Poisson spot is the last of the classical optics experiments to be realized with neutral matter waves. In this paper we report the observation of Poisson's Spot using a beam of neutral deuterium molecules. The wavelength-independence and the weak constraints on angular alignment and position of the circular obstacle make Poisson's spot a promising candidate for applications ranging from the study of large-molecule diffraction and coherence in atom-lasers to patterning with large molecules.

[1]This work was supported by the European Union FP6, program NEST - Adventure, contract nr. 509014, project INA and Bergen Research Foundation.

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Date submitted: 18 Nov 2008 Electronic form version 1.4