Abstract Submitted
for the DPP05 Meeting of
The American Physical Society

**Structure and confinement of Coulomb balls**[1] O. ARP, D. BLOCK, A. PIEL, V. GOLUBNYCHIY, M. BONITZ, Christian-Albrechts-University, D-24098 Kiel, Germany — Coulomb balls [2] are spherical dust clouds of a few hundred micrometer sized particles embedded in a plasma environment. Due to their large negative charge these particles are strongly coupled and can form crystalline structures. Coulomb balls have an unusual crystal structure with nested spherical shells. This contribution presents experiments and simulations on structural properties and trapping of these Coulomb balls. By means of particle imaging velocimetry the contribution of different forces to the confinement is investigated. It is shown that a proper combination of gravity, thermophoresis and electric fields leads to a stable confinement potential. Further, a comparison of experiments with molecular dynamics simulations shows that the structural properties of Coulomb balls require a description based on Yukawa interaction of individual particles.
[1] O. Arp et al, Phys. Rev. Lett. 63, 165004 (2004)

[1]Supported by DFG-TR24/A3 and /A5, partially supported by DLR 50WM0339

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Date submitted: 21 Jul 2005 Electronic form version 1.4