Abstract Submitted
for the GEC06 Meeting of
The American Physical Society

Cavity enhanced spectroscopy on micro spheres levitated in a plasma[1] RALF BASNER, GABRIELE THIEME, JOERG EHLBECK, JUERGEN ROEPCKE, INP Greifswald, Germany, HOLGER KERSTEN, University Kiel, Germany, JONATHAN P. REID, University of Bristol, UK, PAUL B. DAVIES, University of Cambridge, UK — Cavity enhanced spectroscopy has been successfully used as a diagnostic for aerosol droplets. In the present experiments the feasibility of applying this technique to solid micron sized particles levitated in an rf-plasma has been studied. A pulsed laser is used to excite whispering gallery modes in individual micro spheres leading to enhanced Raman scattering at corresponding wavelengths. The investigation of particles coated with fluorescent dye demonstrates the surface sensitivity of cavity enhanced spectroscopy. This non-invasive method gives direct access to the size and also the chemical composition of the micro spheres, and is so a very interesting tool for the characterisation of growing layers deposited onto micro-particles i.e. in molecular plasmas. For particle investigation, an asymmetric capacitively coupled rf-discharge containing two electrodes is used. The upper electrode is rf-driven. The lower adaptive electrode (AE) is divided into ca. 100 square segments which can be biased individually with a DC-voltage allowing a specific manipulation of the particle position.

[1]Work supported by DFG, SFB/TR24.

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Date submitted: 26 May 2006 Electronic form version 1.4