

Abstract Submitted
for the DPP17 Meeting of
The American Physical Society

Trapping and Charging of Aluminum Oxide Nanoparticles in RF Discharges ANDRE MELZER, HARALD KRUEGER, Institute of Physics, University Greifswald — We investigate extended dust clouds of nanoscaled aluminum oxide dust particles in rf discharges. A technique has been developed to disperse the particles into the plasma volume. Apart from the confinement of nanoparticle clouds, different diagnostics for size measurements of the confined particles in the rf discharge will be discussed such as Mie-scattering approaches and SEM measurements. In addition to the size of the confined particles, their charge is of highest interest. Alumina nanoparticles exhibit a phonon resonance in the infrared spectral range. This resonance is calculated to shift by a few wavenumbers due to the charge on the dust. Measurements of this charge-dependent shift will be used to determine the charge of the particles trapped in a dusty plasma. For that purpose, the entire discharge has been integrated into the sample volume of an FTIR. In initial FTIR experiments the resonance has been detected. We will present experiments on the charge-dependent shift of the IR-resonance.

Andre Melzer
Institute of Physics, University Greifswald

Date submitted: 13 Jul 2017

Electronic form version 1.4