

Abstract Submitted  
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**Electric fields measurements in the collisional RF plasma pre-sheath during microgravity conditions** JOB BECKERS, DIRK TRIENEKENS, GERRIT KROESEN, Eindhoven University of Technology, ELEMENTARY PROCESSES IN GAS DISCHARGES TEAM — When a plasma comes into contact with a solid body, a space charge region is formed near that surface. This is due to the difference in mobility between the ions and the much lighter electrons. Electric fields in the plasma sheath have demonstrated to be key in almost every plasma application where the acceleration of ions at the border of the discharge is utilized. However, measuring these fields is extremely difficult. In the lower regions of the plasma sheath, where the electric fields are high, they have been measured by Stark Broadening and Stark shift. To gain higher spatial resolution we have recently developed a novel tool using microparticles under hyper-gravity conditions in a centrifuge. Consequently, measuring at positions closer to the plasma bulk than the equilibrium position of the microparticle under normal gravity conditions was impossible. In this paper we present a continuation of this research line towards positions closer to the plasma bulk. This is achieved a combination of measurements of the microparticle equilibrium position under microgravity conditions during parabolic flights and a collisional plasma sheath model. We have been able to measure the electric field throughout the plasma sheath and a part of the pre-sheath region.

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