

Abstract Submitted
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Plasma Particle Lofting LUCAS HEIJMANS, SANDER NIJDAM,
Eindhoven University of Technology — In plasma particle lofting, macroscopic particles are picked up from a surface by an electric force. This force originates from a plasma that charges both the surface and any particle on it, leading to an electric force that pushes particles off the surface. This process has been suggested as a novel cleaning technique in modern high-tech applications, because it has intrinsic advantages over more traditional methods. Its development is, however, limited by a lack of knowledge of the underlying physics. Although the lofting has been demonstrated before, there are neither numerical nor experimental quantitative measures of it. Especially determining the charge deposited by a plasma on a particle on a surface proves difficult. We have developed a novel experimental method using a “probe force.” This allows us to, for the first time, quantitatively measure the plasma lofting force. By applying this method to different plasma conditions we can identify the important plasma parameters, allowing us to tailor a plasma for specific cleaning applications. Additionally, the quantitative result can help in the development of new models for the electron and ion currents through a plasma sheath.

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