Abstract Submitted
for the GEC16 Meeting of
The American Physical Society

Plasma separation: physical separation at the molecular level RENAUD GUEROULT, LAPLACE, CNRS, JEAN-MARCEL RAX, LOA, CNRS, NATHANIEL J. FISCH, PPPL — Separation techniques are usually divided in two categories depending on the nature of the discriminating property: chemical or physical. Further to this difference, physical and chemical techniques differ in that chemical separation typically occurs at the molecular level, while physical separation techniques commonly operate at the macroscopic scale. Separation based on physical properties can in principle be realized at the molecular or even atomic scale by ionizing the mixture. This is in essence plasma based separation. Due to this fundamental difference, plasma based separation stands out from other separation techniques, and features unique properties. In particular, plasma separation allows separating different elements or chemical compounds based on physical properties. This could prove extremely valuable to separate macroscopically homogeneous mixtures made of substances of similar chemical formulation. Yet, the realization of plasma separation techniques full potential requires identifying and controlling basic mechanisms in complex plasmas which exhibit suitable separation properties. In this paper, we uncover the potential of plasma separation for various applications, and identify the key physics mechanisms upon which hinges the development of these techniques.

Renaud Gueroult
LAPLACE, CNRS

Date submitted: 10 Jun 2016 Electronic form version 1.4