Abstract Submitted
for the DPP15 Meeting of
The American Physical Society

Rotation and differential confinement effects in magnetized plasmas[1] RENAUD GUEROULT, NATHANIEL J. FISCH, Princeton Plasma Physics Laboratory — For certain plasma configurations and plasma parameters, differential confinement effects can lead to ion separation. An example of such configurations is rotating plasmas. As a matter of fact, plasma rotation leads, through centrifugal forces, to mass differential effects. In the collisionless limit, a maximum rotation velocity exists, the Brillouin limit [1], above which no rigid body equilibrium is possible. In fast magnetic plasma compression experiments, the large electric fields induced locally might be sufficiently large to drive significant plasma rotation. Such conditions are for example anticipated for time resolved plasma wave properties control [2]. In this case, the plasma is essentially collisionless, and charge separation effects result from magnetic field variations on a timescale comparable to or shorter than the ion gyro-period. Interestingly, experimental evidence of ion separation has been reported for similar conditions [3]. Preliminary results aiming at identifying the possible role of rotation on ion separation are presented.

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[1]Work supported under the DOE 67350-9960 (Prime # DOE DENA0001836), DOE DE-FG02-06ER54851 and DOE DE-AC02-09CH11466.

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Date submitted: 21 Jul 2015 Electronic form version 1.4