Abstract Submitted
for the DPP12 Meeting of
The American Physical Society

The ion distribution in a field-reversed configuration heated by odd-parity rotating magnetic field CHANG LIU, SAMUEL COHEN, Princeton Plasma Physics Laboratory — The ion heating effect of odd-parity rotating magnetic field (oRMF) in a field-reversed magnetic configuration (FRC) is studied by a single particle Hamiltonian code. By varying the particle initial condition and assuming the ergodic hypothesis, we obtain a particle distribution on both configuration space and velocity space. The simulation shows that strong enough RMF will give high energy betatron orbit particles a strong concentration effect in the frame rotating with the RMF. Moreover, the RMF will accelerate the particles to form a double bump distribution rather than a Maxwellian. Both of those effect will improve the nuclear fusion efficiency and will increase the energy ratio of charged particles to neutrons when D-He^3 is used as fuel, which is good to future FRC-based nuclear fusion plant.

Chang Liu
Princeton Plasma Physics Laboratory

Date submitted: 06 Sep 2012 Electronic form version 1.4