Abstract Submitted
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Instability studies of a spherical electrostatic confinement H.J. KIM, G.H. MILEY, UIUC — The spherical inertial electrostatic confinement concept offers an alternative fusion plasma confinement scheme, where charged particles are accelerated and confined electrostatically with a series of biased spherical concentric electrodes. It is very attractive for a power plant due to its mechanical simplicity and high power-to-mass ratio. However, its beam-plasma interactions are not clearly understood. In order to evaluate the concept, a perturbative (δf) particle simulation technique[1] for a kinetic analysis is applied to simulate completely the dynamic evolution of perturbed Vlasov-Poisson equations. This model is used to study the behavior of two-stream-like instabilities related to the trapped spherically converging ions. Results show that steady-state solutions of the self-consistent Vlasov-Poisson equation in which angular momentum of positively charged particle becomes lower correspond to the formation of a deep potential well. Also, it is shown that the growth rates are a decreasing function of angular momentum spread and an increasing function of longitudinal velocity spread.

[1]S. E. Parker and W. W. Lee, *Phys. Fluids B* **5**, 77 (1993).

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