

Abstract Submitted
for the DPP14 Meeting of
The American Physical Society

Ions acoustic oscillations driven by ion flow in a finite length systems OLEKSANDR KOSHKAROV, ANDREI SMOLYAKOV, University of Saskatchewan, IGOR KAGANOVICH, Princeton Plasma Physics Laboratory, VICTOR ILGISONIS, Russian Research Centre “Kurchatov Institute” — Plasmas with stationary flow are common in a number of application such as diagnostics with emissive probes, plasma electronics and electric propulsion devices. The presence of plasma flows often lead to the instabilities in such systems and subsequent development of large amplitude perturbations. In this work we consider dynamics of ion acoustic oscillations in a finite length plasma with the equilibrium flow of ions. It is shown that the finite flow induces the instability due to coupling of the negative and positive energy modes. The mode coupling occurs via boundary conditions in a finite length system. The instability is studied via combination of analytical theory and numerical methods utilizing Godunov and multiple shooting schemes. The instability diagram is obtained as a function of the flow velocity and the system length.

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Date submitted: 11 Sep 2014

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