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Ion sound instability driven by the ion flow in a system of the finite length O. KOSHKAROV, A. SMOLYAKOV, University of Saskatchewan, Saskatoon SK, Canada, I. KAGANOVICH, Princeton Plasma Physics Laboratory, Princeton NJ, USA, V.I. ILGISONIS, NATIONAL RESEARCH CENTRE "KURCHATOV INSTITUTE", Moscow Russian Federation — Ion sound instabilities driven by the ion flow in a system of a finite length are considered by analytical and numerical methods. The ion sound waves are modified by the presence of stationary ion flow resulting in negative and positive energy modes. The instability develops due to coupling of negative and positive energy modes mediated by reflections from the boundary. It is shown that the wave dispersion due to deviation from quasineutrality is a crucial parameter that determines the stability. In finite length system, the disperson is characterized by the length of the system measured in units of the Debye length. The instability is studied analytically and the results are compared with direct, initial value numerical simulations. It is shown that boundary effects result in the instability under the conditions when the standard kinetic ion sound instability does not occur.

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