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# The effects of drifting warm ions on fast ion-acoustic soliton stopbands

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The effects of the inclusion of finite drift speed for the warm ions on fast ion-acoustic soliton stopbands is theoretically investigated
in a plasma which is composed of cold ions, warm (adiabatic) ions and Boltzmann electrons. The stopbands are intermediate ranges in speed for which solitons cannot propagate, yet soliton propagation is still possible for lower and higher speeds. For warm ions which are drifting along the direction of wave propagation, increasing beam speed results in the widening of the stopbands over the range of cold ion densities. The stopbands are not supported when the warm ion limiting curve is single-valued over the range of cold ion densities for a sufficiently large value of the drift speed. Negative values for the beam speed for warm ions which are drifting anti-parallel to the direction of wave propagation, have the effect of narrowing the stopbands over the range of cold ion densities when the drift speed increases. The considered plasma model may be applicable to conditions in the solar wind where differences between the bulk speeds of the heavier helium ions and protons can arise under some circumstances [1].

[1] K. W. Ogilvie, J. Geophys. Res. 80, 1335-1338, doi:10.1029/JA080i010p01335 (1975).

## Apply to be<br> considered for a student <br>   award (Yes / No)?

No

## Level for award<br> (Hons, MSc, <br>   PhD, N/A)?

N/A

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