Ion Bernstein Mode with non-Thermal distribution functions

Sadia Zaheer[1]
[1] Department of physics, Forman Christian College (Chartered University), Lahore Pakistan
e-mail (sadiazaheer@fccollege.edu.pk):
As an AAPPS-DPP standard, we do not need to add your postal address.

Bernstein wave mode is an electrostatic wave mode propagating perpendicular to the external magnetic field B_0. The Bernstein mode instability plays a vital role in tokomaks and space plasma regimes like Jovian planets and interstellar space. The ion Bernstein wave, i.e., a hot plasma wave, is used to carry radio-frequency power to heat a tokomak reactor core. Current-driven electron Bernstein wave heating in spherical tokomaks has been explored because the high density and low magnetic field configuration.

In this work, we have studied the growth rate of Ion Bernstein Wave (IBW) with different Non-Maxwellian distribution functions which explains a direct correlation of streaming ion velocity with the temperature of the IBW. We have observed that the Ions are assumed a fundamental part in moving the threshold recurrence value towards lower frequency system.

As the ratio of the negative particles of plasma to cyclotron recurrence is increased, at lower values of spectral indexes, the bends are moved towards greater wave numbers. The growth rate has also been determined numerically as well as graphically. The graphical correlation gives us the field of vision of unsteady regimes. It becomes more unsteady while we increase the value of frequency ratio or increase the value of n. It also tells us that when we increase the value of spectral indexes up to infinity at the different values of n; the results reveal the same behavior as obtained with the Maxwellian distribution function.

References

F. Nsengiyumva,a) R. L. Mace,b) and M. A. Hellbergc)
(PHYS. PLASMAS 20, 102107 (2013))