**Two Stream Instability in an Inhomogeneous Magnetized Plasma**
JYOTI JYOTI, HITENDRA MALIK, Indian Institute of Technology Delhi — A
plasma can support several kinds of electrostatic and electromagnetic waves de-
pending upon what the external perturbations are and how the plasma is generated
or under what conditions the waves are excited. In the presence of magnetic field,
more new kinds of the waves can evolve in the plasma. Moreover, if the free energy is
available in the system, then these waves can grow at the cost of this free energy and
hence instabilities can take place. In the present investigation, we make an analyti-
cal study of a two stream instability in an inhomogeneous magnetized plasma having
drifting ions and electrons. We consider a general situation by taking an oblique
propagation of the wave from the magnetic field and a constant ionization. Using
normal mode analysis, we derive dispersion relation which is solved numerically for
the growth rate of the instability. The behavior of growth rate with magnetic field
and the propagation angle along with ionization constant has been studied for two
different wavelengths of the oscillations. We observe two type of the instabilities out
of which one grows at a faster rate and hence is named as fast growing instability.
The growth rate of the other slowly growing instability is also examined. We find
that the growth rates of both the instabilities attain higher magnitudes at smaller
wavelength of the oscillations.

Jyoti Jyoti
Indian Institute of Technology Delhi