

بسمه تعالی

اطلاعیه برگزاری سمینار علمی

عنوان:

Wonderful World of Plasma Waves from the Near Earth Environment to the Laboratory

ارائه دهنده:

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Abstract:

The region of the Earth from Surface to Space supports a large number of waves propagating on the sea surface, in the neutral atmosphere, and through the ionospheric plasma. Use of high-frequency (HF) heating experiments has been extended in recent years as a useful methodology for plasma physicists wishing to remotely study the properties and behavior of the ionosphere as well as nonlinear plasma processes. The high-power transmitters used for these experiments are sometimes called HF facilities or HF heaters, since the electric field in the transmitted radio wave can reach over 1 V/m, more than strong enough to energize the ionospheric electrons within the beam of the transmitter, which then collide with the ions, randomizing and thermalizing their energy and increasing the electron and ion temperatures.

The HF pump wave can produce Stimulated Electromagnetic Emissions (SEEs) through the parametric decay instability (PDI).

A new era of ionospheric remote sensing techniques was begun after the recent update of the HF transmitter at the High Frequency Active Auroral Research Program (HAARP) facility. Increasing the maximum transmitter power up to 3.6 MW (ERP~1 GW) has made studying some of the parametric decay instabilities responsible for SEE, which was not possible a few short years ago. We have studied the characteristics and the excitation of Stimulated Ion Bernstein Scatter (SIBS), and Magnetized Stimulated Brillouin Scatter (MSBS) in the ionospheric plasma for the first time. The second part of this talk will be dedicated to our recent modeling and experimental observations of dusty space plasma including dusty plasma waves and instabilities.

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