

Tutorial:Recent developments in the fields of plasma heating and wave-particle interaction

Takeru Suzuki[1]; Yoshiharu Omura[2]; Kazuhiro Akimoto[3]

[1] Kyoto Univ; [2] RISH, Kyoto Univ.; [3] Science and Engineering, Teikyo Univ

Recent developments concerning plasma heating and wave-particle interaction in the fields of fundamental plasma physics, space science, and astronomy are described.

In plasma physics, so-called beam holes developed by the cold beam-plasma instabilities are experimentally confirmed by Takeda and Yamagiwa at Shizuoka University. Detailed information about the formation of cavitons(Langmuir solitons) are being obtained by a Colorado University team through 2- and 3D computer simulations.

In space physics, recent important advances include the investigation of multi-dimensional structures of the phase-space electron holes as well as the understanding of relativistic particle accelerations by whistler waves in the inner magnetosphere of the earth.

And finally, in the field of astrophysics, it is being confirmed that Alfvén waves are playing an important role in heating stellar atmosphere. Other regions where plasma wave activities appear to be important include inter-stellar space and galactic clusters.