

# Spatial Structure of Spontaneously Excited ICRF Waves and Relevant High-Energy Ion Loss in the GAMMA 10 Tandem Mirror

**Abstract.** High-beta plasma confinement in a mirror field is subject to the influence of the temperature-anisotropy driven mode referred as Alfvén-ion-cyclotron (AIC) wave. Saturation of diamagnetism and anisotropy of ion temperature is observed along with enhanced axial loss of high-energy ions when the heating power increases in GAMMA 10. High energy ions of over 6 keV

**A** shows burst-like axial loss, of which cycles are just the difference frequencies between the simultaneously excited AIC waves. The detailed spatial structure of the density fluctuation associated with the AIC waves is successfully obtained by recently upgraded reflectometer system. The reflectometer scanned the internal plasma, where wave-particle interaction leading to the axial loss of high-energy ions occurred, both in radial and axial directions. The density fluctuations of the AIC waves are highest

**B** near the midplane and decreases toward the mirror throat. These radial profiles are round top near the midplane of the central cell, and the peak radii move to the outer region toward the mirror throat. Simultaneous assessment of both the interacting wave and ions is largely progressed, which will be helpful for the clarification of intervening wave-particle interactions.

