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

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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. The spatial structure of the AIC waves and the enhanced loss of high-energy ions owing to the AIC waves are simultaneously investigated in GAMMA 10 from a standpoint of wave-particle interaction. A clear correlation between the excitation of the AIC waves and the enhanced axial loss of high-energy ions is obtained and precise spatial structure of the AIC waves including those power and phase profiles, which is a key for the understanding of the temperature-anisotropy relaxation process, is clarified by using a reflectometer for the first time.

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