Contribution ID: **394** Type: **Poster**

TH/P6-20: Linear Properties and Nonlinear Frequency Chirping of Energetic Particle Driven Geodesic Acoustic Mode in LHD

Thursday, 11 October 2012 14:00 (4h 45m)

Linear properties and nonlinear evolution of energetic particle driven geodesic acoustic mode (GAM) have been investigated for the Large Helical Device (LHD) plasmas with a hybrid simulation code for energetic particles and magnetohydrodynamics (MHD). Good agreement was found for the frequency and the spatial location of GAM between the experiment and the simulation. Frequency chirping up of the GAM was observed in the experiment. We found frequency chirping takes place in the nonlinear evolution of the GAM. We analyzed the fluctuation of the energetic particle distribution function and the energy transfer rate in velocity space. It was found that two pairs of hole and clump are formed along constant magnetic moment curves in velocity space. Transit frequencies of the holes and clumps are in good agreement with the GAM frequencies in the nonlinear phase. This indicates the holes and clumps keep resonant with the GAM when the frequency chirping takes place. It is clarified with the energy transfer analysis that the GAM amplitude evolution is governed by the interaction with the resonant particles in the hole at the high energy side.

Country or International Organization of Primary Author

Japan

Primary author: Mr WANG, Hao (The Graduate University for Advanced Studies)

Co-authors: Prof. KIM, Charlson (University of Washington); Mr TODO, Yasushi (Japan)

Presenter: Mr TODO, Yasushi (Japan)

Session Classification: Poster: P6

Track Classification: THW - Magnetic Confinement Theory and Modelling: Wave–plasma interactions; current drive; heating; energetic particles