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TH/P6-01: Frequency Chirping during a Fishbone Burst

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

It is shown that gradual (more than a factor of two, in some cases - down to zero in the lab frame) reduction of the mode frequency (the so called frequency chirping) can be attributed to the reactive torque exerted on the plasma during the fishbone instability burst, which slows down the plasma rotation inside the q=1 surface and reduces the mode frequency in the lab frame, while frequency in the plasma frame remains constant. This torque arises due to imbalance between the power transfered to the mode by energeric ions and the power of the mode dissipation by thermal species. Estimates show that the peak value of this torque exceeds the neutral beam torque in modern tokamaks and in ITER. The line-broadened quasilinear burst model, properly adapted for the fishbone case, is capable of reproducing the key features of the bursting mode.

Country or International Organization of Primary Author

Ukraine

Primary author: Mr MARCHENKO, Victor (Institute for Nuclear Research, Kyiv, Ukraine)

Co-author: Dr REZNIK, Svyatoslav (Institute for Nuclear Research, Kyiv, Ukraine)

Presenter: Mr MARCHENKO, Victor (Institute for Nuclear Research, Kyiv, Ukraine)

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