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Comparison and prediction of chirping in NSTX and DIII-D VINICIUS DUARTE, Princeton Plasma Phys Lab, HERBERT BERK, University of Texas, Austin, NIKOLAI GORELENKOV, Princeton Plasma Phys Lab, WILLIAM HEIDBRINK, University of California, Irvine, GERRIT KRAMER, RAFFI NAZIKIAN, Princeton Plasma Phys Lab, DAVID PACE, General Atomics, MARIO PODESTA, Princeton Plasma Phys Lab, MICHAEL VAN ZEELAND, General Atomics — We present an explanation of why frequency chirping of Alfven waves is ubiquitous in NSTX and rarely observed in DIII-D. A time-delayed cubic nonlinear equation [1,2] is employed for the study of the onset of nonlinear phasespace structures. Its explosive solutions are chirping precursors. We employ NOVA and NOVA-K codes to provide consistent Alfvenic eigenmodes and weighted physical contributions from all regions of phase space. In addition, TRANSP is employed to determine the diffusivity needed to fulfill power balance. Though background micro-turbulence is usually unimportant in determining the energetic particle spatial profile, it may still be important with regard to whether chirping structures likely form. We show that the energetic particle micro-turbulent induced scattering often competes with collisional pitch-angle scattering. This competition explains the tendency for NSTX, where micro-turbulence is weak, to exhibit Alfvénic chirping, whereas in DIII-D turbulent diffusion usually dominates and chirping is not observed except when micro-turbulence markedly reduces. [1] F. J. Hickernell, J. Fluid Mech. 142, 431 (1984). [2] H. L. Berk, B. N. Breizman and M. Pekker, *Phys. Rev. Lett.* **76**, 1256 (1996).

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