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On the conditions for the onset of nonlinear chirping structures in NSTX VINICIUS DUARTE, MARIO PODESTA, Princeton Plasma Physics Laboratory, HERBERT BERK, Institute for Fusion Studies, University of Texas, Austin, NIKOLAI GORELENKOV, Princeton Plasma Physics Laboratory — The nonlinear dynamics of phase space structures is a topic of interest in tokamak physics in connection with fast ion loss mechanisms. The onset of phase-space holes and clumps has been theoretically shown to be associated with an explosive solution of an integro-differential, nonlocal cubic equation that governs the early mode amplitude evolution in the weakly nonlinear regime. The existence and stability of the solutions of the cubic equation have been theoretically studied as a function of Fokker-Planck coefficients [M. K. Lilley, B. N. Breizman and S. E. Sharapov, Phys. Rev. Lett. 102, 195003 (2009)] for the idealized case of a single resonant point of a localized mode. From realistic computations of NSTX mode structures and resonant surfaces, we calculate effective pitch angle scattering and slowing-down (drag) collisional coefficients and analyze NSTX discharges for different cases with respect to chirping experimental observation. Those results are confronted to the theory that predicts the parameters region that allow for chirping to take place.

Vinicius Duarte
Princeton Plasma Physics Laboratory

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