

Abstract Submitted  
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**Adiabatic description of long range frequency sweeping**<sup>1</sup> BORIS BREIZMAN, Institute for Fusion Studies, The University of Texas at Austin, ROBERT NYQVIST, Chalmers University of Technology, Goteborg, Sweden, MATTHEW LILLEY, Imperial College, London, UK — A theoretical framework is developed to describe long range frequency sweeping events in the 1D electrostatic bump-on-tail model with fast particle sources and collisions. The model includes three collision operators (Krook, drag (dynamical friction) and velocity space diffusion), and allows for a general shape of the fast particle distribution function. The behavior of phase space holes and clumps is analyzed, and the effect of particle trapping due to separatrix expansion is discussed. With a fast particle distribution function whose slope decays above the resonant phase velocity, hooked frequency sweeping is found for holes in the presence of drag collisions alone.

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