

**Intermittent dynamics in fusion plasmas: The dissipative trapped-ion mode**Erico L. Rempel*Instituto Tecnológico de Aeronáutica (ITA) e World Institute for Space Environment Research (WISER), Pça. Marechal Eduardo Gomes 50, Vila das Acácias, 12228-900, São José dos Campos, SP*

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Plasma confinement in toroidal devices can be seriously impaired by the presence of instabilities associated to particles trapped in magnetic wells generated by the magnetic field inhomogeneity. Oscillations of such particles give rise to the dissipative trapped-ion mode, a low frequency electrostatic drift wave which can become unstable due to electron collisions. The instability can be saturated by Landau damping, due to free and trapped ions. In the limit where the wave frequency is small compared with the effective electron collision frequency, a nonlinear partial differential equation for the electrostatic potential can be obtained in the form of the Kuramoto-Sivashinsky equation. In this work we study the nonlinear dynamics of the dissipative trapped-ion mode by numerically solving the Kuramoto-Sivashinsky equation. By varying the control parameter representing Landau damping, a series of bifurcations are reported, leading the wave from periodic to chaotic and intermittent regimes. We also describe how a global bifurcation known as attractor merging crisis is responsible for an intermittent behavior where the time series of the electrostatic potential alternate between two distinct chaotic states. In such regime we show how the detection and analysis of nonattracting chaotic sets can be useful in the prediction of the characteristic intermittency time, that is, the average time in which a typical time series spends in each of the two distinct chaotic states.