

Abstract Submitted  
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**Nonlinear dynamics of multiple NTMs in tokamaks** D. CHANDRA, Institute for Plasma Research, Gandhinagar, India, O. AGULLO, S. BENKADDA, CNRS-Universite de Provence, 13397 Marseille cedex 20, France, X. GARBET, Association Euratom-CEA, DRFC, CEA Cadarache, 13108 St-Paul-Lez-Durance, France, A. SEN, Institute for Plasma Research, Gandhinagar, India — The nonlinear evolution of two coupled neoclassical tearing modes (NTMs) is investigated through numerical simulations using a 3D toroidal code based on a set of generalized reduced MHD equations. The parametric interaction of the 2/1 and 3/1 modes is seen to result in the excitation of low frequency oscillations in the range of acoustic frequencies. The GAM like oscillations manifest themselves as oscillations in the energies of the NTMs and their origin is traced to the presence of the finite neoclassical electron stress tensor contribution in the Ohm's law. This contribution has the effect of making the flow energies of the modes to become larger than the magnetic energies of the modes and the perpendicular flow patterns to spread out from the mode resonant surfaces. Such an expanded flow pattern is seen to be responsible for the effective coupling between the two modes despite their resonance surfaces being quite apart. The physical implications of this novel coupling mechanism on the saturated amplitudes of the NTMs and their relevance to some recent experimental results are discussed.

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