Novel Mode-Particle Resonances for Ballooning Modes in Fusion Reacting Plasmas* B. Basu¹, B. Coppi¹ and A. Cardinali² ¹MIT and ²ENEA (Italy)

As is well known, the excitation of ballooning modes introduced originally in the mid-sixties [1,2] plays an important role in the dynamics of magnetically confined plasmas. A significant class [3] of these modes are oscillatory in time [4], localized along the magnetic field lines, and can be viewed as a superposition of oppositely propagating waves with equal amplitudes. These modes involve mode-particle resonances with high energy particles populations that are significantly different from the commonly known Landau resonances. In fusion burning plasmas [3] thermal particles that are the majority coexists with high energy particle populations and the considered mode-particle resonances are of relevance to them. *Sponsored in part by the U.S. Department of Energy and by C.N.R. of Italy.

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