

Abstract Submitted  
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**Nonlinear Saturation Physics of the ETG Modes** VLADIMIR SOKOLOV, E TOKLUOGLU, A.K. SEN, Columbia University — Production and identification of electron temperature gradient (ETG) mode and the measurement of electron thermal conductivity due to it have been successfully done in a basic experiment in Columbia Linear Machine CLM [1,2]. Now we report the nonlinear saturation mechanism of the ETG modes. The bi-coherence experimental data shows coupling between two high frequency ( $\sim 2MHz$ ) and one low frequency ( $\sim 40kHz$ ) modes. The 3-wave coupling model (two radial harmonics ETG and one ion acoustic mode) yielded a theoretical saturation level of ETG mode  $\sim 5\%$ , which roughly agrees with experiments. The role of ion acoustic mode in the saturation of ETG mode has also been experimentally demonstrated by using unique feedback techniques. This research was supported by U.S. Department of Energy Grant No. DE-FG02-98ER-54464.

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[2] V. Sokolov, A.K. Sen, APS DPP10, TP9.00022

Vladimir Sokolov  
Columbia University

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