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Generation of electromagnetic waves by drift wave – zonal flow turbulence in magnetically confined fusion plasma W. HORTON, C. CORREA, UT Austin, IFS, J. KIM, U of Wisconsin, G.D. CHAGELISHVILI, V.S. AVSARKISOV, R.G. CHANISHVILI, GENAO, Chavchavadze State U, M.Nodia Inst. of Geophys. — According to recent experiments [1,2], magnetically confined fusion plasma "drift wave – zonal flow turbulence" gives rise to broad bend of electromagnetic waves. Ref. [1] reports abrupt changes in magnetic turbulence during L–H transitions in JET plasmas, i.e. appearance of broad spectra of electromagnetic waves, when zonal flow comes into play. Alfvenic fluctuations appear from **ExB** flow driven turbulence in experiments on the Large Plasma Device (LAPD) at UCLA [2]. We explain the generation of EM waves in DW-ZF systems on an example of LAPD experiments. Our research is based on a break-through by the hydrodynamic community in the 1990s in understanding the physics of spectrally stable nonuniform flows; these flows are non-normal and result in linear transient growth of perturbations and their coupling. The mode linear coupling in shear flows causes the generation of electromagnetic waves in the considered DW-ZF system. We study dependence of the generation on parameters of the system and show that this phenomenon is universal at high shear rates of ZF and should take place in tokamaks.
[1] Sharapov et al. 21st US TTF Workshop, Boulder, CO, March 2008.
[2] Perez, et al. Phys Plasmas, 13,055701, 2006.

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