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Whistlers of ultra-low frequency in tokamak discharges with Internal Transport Barriers BORIS BREIZMAN, Institute for Fusion Studies, The University of Texas, Austin, Texas 78712, USA, SERGEI SHARAPOV, Euratom/UKAEA Fusion Association, Culham Science Centre, Abingdon, OXON OX14 3DB, UK — Conventional frequencies of whistlers are above the ion gyrofrequency, so that ions are not magnetized in these waves. However, in perturbations with very short radial wavelength, $k_r\rho_i \geq 1$, the ions are not magnetized even at lower frequencies, which creates a parameter window for ultra-low-frequency whistlers. We present a theoretical description of such waves in inhomogeneous toroidal plasmas. The electron density gradient is shown to cause strong currents parallel to the equilibrium magnetic field and to form radial eigenmodes. The characteristic features of these modes are similar to the experimentally observed magnetic turbulence in ITB discharges on JET [1]. The relation between these modes and short-wavelength zero-frequency magnetic islands [2, 3] is also discussed. [1] S.E. Sharapov, F.M. Poli and JET-EFDA Contributors, EPS (2008). [2] B.B. Kadomtsev, Nuclear Fusion, v.31, p.1301 (1991). [3] P.H. Rebut and M. Hugon, PPCF, v.33, p.1085 (1991).

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