

Subject: 7) Physics of stochastic edge plasmas with respect to error fields, locked modes, and resistive wall modes.

INFLUENCE OF TOKAMAK CURRENT PROFILE ON PENETRATION OF AN EXTERNAL LOW FREQUENCY HELICAL MAGNETIC PERTURBATION INTO EDGE PLASMA

I.M. Pankratov, A.Ya. Omelchenko, V.V. Olshansky

*Institute of Plasma Physics,
National Science Center “Kharkov Institute of Physics and Technology”
Akademicheskaya str., 1, 61108 Kharkov, Ukraine*

The strong influence of an equilibrium current profile (near the resonant zone) on penetration an external rotating helical perturbation is found. The change of this profile may occur as result of the penetrating wave back effect.

In the two-fluid MHD cylindrical model [1] the current gradient influence is investigated for HYBTOK-II parameters: the toroidal magnetic field $B_{z0} = 0.28$ T, the plasma current $I_p = 5$ kA, the edge electron density $n_e = 1.2 \times 10^{18} m^{-3}$ and the electron temperature $T_e = 20$ eV. The poloidal and toroidal plasma rotations are taken into account [2]. The main HYBTOK-II resonant mode $q(r_{res})=6/1$ is investigated, the driven frequency is 5 kHz.

A comparison of the calculated magnetic perturbation profile with HYBTOK-II experiments shows a good agreement.

[1] I.M. Pankratov, A.Ya. Omelchenko, V.V. Olshansky, K.H. Finken, Nucl. Fusion **44** (2004) S37.

[2] V.P. Budaev, I.M. Pankratov, S. Takamura, et al., 33rd EPS Conf. on Plasma Physics (Roma, Italy, 2006) P4.109.