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Properties of a hairpin probe in a strongly magnetized plasma[1]

S.K. KARKARI, National Center for Plasma Science and Technology, Dublin City University, Collins Avenue, Dublin 9, Ireland, G.S. GOGNA, National Center for Plasma Science and Technology, Dublin City University, Dublin 9, Ireland, D. BOILSON, Department CEA/DSM/DRFC, CEA-Cadarache, 13108 ST PAUL-LEZ-DURANCE France — Understanding of the physics in the filter field region of a neutral beam injection source for ITER under development is very important, as this region is where the negative ions are generated and extracted. For accurately determining electron densities in this complex plasma, a floating hairpin probe is applied on the KAMABOKO III ion source, at the MANTIS test bed at CEA Cadarache. The technique is based on measuring the probes resonance frequency (few GHz) shift in plasma with respect to that obtained in vacuum. The resonance frequency is proportional to the permittivity of the medium filling the space between the wires of the hairpin resonator. Using this technique we obtained the electron density variation as function of discharge power and on the external grid bias in front of the plasma grid.

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