Contribution ID : **356** Type : **not specified**

8.54 Development of a multi-channel capacitive probe for electric field measurements with fine spatial resolution

Tuesday, 17 April 2018 16:01 (120)

Reliable electric field measurements in a plasma are challenging, especially when fine resolution of spatial structure is critical. A capacitive probe [Mingsheng, Tan, et al. Rev. Sci. Instrum 88, 023502 (2017)] is one of a few diagnostics that are directly sensitive to the plasma potential. In such a probe, a boron nitride ceramic (BN) covers an electrode and a capacitor is formed between the electrode and the plasma with the BN serving as a dielectric material. When the electron temperature is above 18 eV, the floating potential of the BN becomes the same as the plasma potential due to increased secondary electron emission. Therefore, the spatial structure of the electric field can be measured by using an array of capacitive electrodes. We develop a multi-channel capacitive probe for fine radial electric field measurements. In order to assure stable operation of an electrode with small collecting surface area over a wide frequency range, a high input impedance amplifier with driven guard is employed. Preliminary data are presented showing that the multi-channel capacitive probe can resolve both equilibrium, few hundreds of Hz, and fluctuating, up to ˜500 kHz, radial electric fields with the spatial resolution of 7 mm.

Primary author(s) : NISHIZAWA, Takashi (UW Madison)

Co-author(s) : ALMAGRI, Abdulgader (UW Madison); SARFF, John (UW Madison); GOODMAN, Wayne (UW Madison); OHSHIMA, Shinsuke (Institute of Advanced Energy, Kyoto University)

Presenter(s) : NISHIZAWA, Takashi (UW Madison); ALMAGRI, Abdulgader (UW Madison); SARFF, John (UW Madison); GOODMAN, Wayne (UW Madison); OHSHIMA, Shinsuke (Institute of Advanced Energy, Kyoto University)

Session Classification : Session #8, Tuesday Afternoon Poster Session