Magnetic Field Mapping and Start Up Studies on GLAST-III

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Abstract

GLAST-III (Glass Spherical Tokamak) is operational at NTFP, Pakistan which is upgraded version of GLAST I & II. It has Major radius R=20 cm and minor radius a=10 cm with aspect ratio A=2. The vacuum vessel is made of glass and can achieve vacuum up to ~10^{-7} mbar. As the vessel is made of dielectric material, therefore field penetration is fast as compared with the metals (conducting materials). This property is useful for creating the equilibrium in glass. The magnetic field mapping of fields produced from CS (Central Solenoid) and CC (Compensation Coils), TF (Toroidal Field) coils and PF (Poloidal Field) coils is performed inside the vessel. The measured values and results are compared with numerical results. During the mapping campaign modification in the compensation coils turns is also made. Finally we are able to reduce the vertical magnetic field component up to 1.15 Gauss/kA at 7cm away from inboard side which is almost constant in time.

After the field mapping, we are able to produce plasma current up to 5kA for 1ms in an Argon plasma microwave assisted discharge. For this purpose a magnetron from domestic microwave oven is modified into pulsed form so as to produce a pulse of 4 ms. Temperature and density of Edge plasma is estimated by using triple Langmuir probe. HR 4000 spectrometer is used for emission spectroscopy in the visible region to calculate the average electron temperature. Results from Spectroscopic measurement and plasma imagining will be presented.

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