

Measuring and analyzing the magnetic field in (SERAJ system) theta pinch device using the Magnetic probes

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By using the internal and the external magnetic probes in different positions inside and outside plasma discharge chamber of Seraj's Theta-pinch system ($L = 150\text{cm}$, $D = 8.4\text{cm}$), the generated magnetic field on the coil of Seraj's system was calculated. When the plasma is discharged (by discharging a four capacitor bank connected on parallel, capacity of each is $12.5\mu\text{F}$) in the system coil (12nH) the characteristics of plasma is defined by how much magnetic field is effected. By comparing the magnetic field in (absence and presence) of plasma, trapped magnetic field and Diamagnetic effect could be determined in the Theta pinch system. In such study, we could determine the appropriate operating circumstances to produce suitable plasma with specific features (density & electron temperature) to take advantage for different applications of plasma.

Key words: (Magnetic probes), (plasma diagnostic), (Theta pinch system), (Magnetic field), (Diamagnetic field), and (Trapped magnetic field).