

Plasma Diagnostics in the Optical and X-Ray Regions on the IEC Plasma Device

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The design and construction of first Egyptian inertial electrostatic confinement IEC fusion device has been studied [1]. It consists of 2.8 cm stainless steel cathode, 6.5 cm anode diameter with 10 cm diameter 20 cm height vacuum chamber. The operation of IEC experiments has concentrated on pulsed operation to achieve the high currents required to generate increased reactions rates. The discharge voltage waveform with peak voltage 12kV with a full width half maximum (FWHM) of 10 nanoseconds and current pulse waveform has been registered using pick-up coil with peak current about 170mA. Experiments are performed with nitrogen and hydrogen as operating gases at different pressures and voltages. Time resolved of x-ray radiation signals are obtained using fast radiation detector.

References:

Elaragi GM, "Operation of Inertial Electrostatic Confinement Fusion (IECF) Device using different gases" Journal of Fusion Energy (JOFE) (2018)

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