

Hollow cathode effects observed in magnetically confined plasmas used for deposition of DLC films via PIII&D in tubes

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Abstract: Hollow cathode discharges were evaluated under the effects of the ExB crossed fields for deposition of DLC (Diamond-like Carbon) films. The stabilities of various plasma discharges, as well as, the produced plasma confinement were enhanced significantly with the magnetic field application. Experimental tests corroborate the positive action of ExB mechanism for the improvement of PIII&D (Plasma Immersion Ion Implantation and Deposition) in metal tubes. As regards to the structure of the obtained carbon films, the magnetic field application improves their diamond-like character. Magnetically confined plasmas resulted in DLC films with defect-free morphology and lower roughness. Using this type of PIII&D setup is highly recommended for inner surface coating of tubes when highly disordered DLC films are required.

Keywords : PIII&D, Hollow cathode discharges, DLC films, Magnetic field.

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