

Abstract Submitted
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Investigation of a cylindrical transparent cathode discharge

MARK BOWDEN, TOM HARDIMENT, University of Liverpool — The term Transparent Cathode Discharge (TCD) refers to a low-pressure electrical discharge also known as an Inertial Electrostatic Confinement (IEC) plasma. A defining characteristic is that the discharge is generated by a hollow, grid-constructed cathode and an outer, concentrically-arranged anode. Ions and electrons are accelerated by a large potential applied between the grids, with plasma being generated in different parts of the system depending on operating conditions. This project aims to study this device in order to assess its suitability for development as a reactive plasma source. A TCD device with concentric, cylindrical, mesh electrodes was operated in noble and molecular gases, and the discharge observed with a combination of emission imaging, emission spectroscopy and electrical probe diagnostic techniques. Preliminary measurements indicate that the alignment of the apertures in the inner and outer grid electrodes plays key role in determining discharge behaviour.

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