

# **Pre-Breakdown Processes in the Hollow Cathode Region of a Transient Hollow Cathode Discharge**

M. Favre, J. Moreno, H. Chuaqui, E. Wyndham, M. Zambra, P. Choi, C. Dumitrescu-Zoita

## **Abstract**

Discharge formation in the A–K space of transient hollow cathode discharge (THCD) is causally linked with the emission of high energy electron beams originating in the hollow cathode region (HCR). Ionization in the A–K gap proceeds through the formation of a moving virtual anode, whose time evolution is strongly correlated with different periods in the electron beam activity. Here, we report on time and space resolved observations of different ionization events inside the HCR, which are time correlated with ionization processes inside the A–K gap. The experiments have been performed in Hydrogen, at pressures between 50 and 400 mTorr. A statistical study of the characteristic times associated with the different ionization events, based on von Laue plots, shows that the time distribution of events is well described by a single Gaussian distribution.