

Abstract Submitted
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The Influence of Polymer Films on an APGD in Helium DAMIAN DELLA CROCE, GAGIK NERSISYAN, WILLIAM GRAHAM, Physics and Astronomy, Queens University Belfast, BT7 1NN, Northern Ireland — Electrical and optical diagnostic techniques have been used to study the influence of various polymers in the gap of a Helium APGD. A gated ICCD was used to record short exposure time images ($2\mu\text{s}$) through the development of the discharge current pulse. The APGD was generated between two parallel, glass 4mm thick plates which cover copper mesh electrodes. The gap was 5mm. Typically a 4.4kV (peak to peak) sinusoidal voltage was applied to the powered electrode with a frequency of 30kHz. The other electrode was grounded. The system was housed in an evacuated chamber, previously evacuated to a base pressure of 10^{-4} Pa, before Helium was introduced to static atmospheric pressure. A spectrometer was used to record the emission spectra from the discharge. To date studies on polypropylene (PP) and polyester (PET) have been conducted and polyamide will follow. Interesting trends are evident when they are compared to those for the He APGD with no polymer present. Electrically the traces for PET are dramatically different to those for PP and no polymer, which are comparable. Imaging shows that PP yields a filamentary discharge. PET on the other hand produces a glow –type discharge. We are currently studying if the different results are intrinsic to the polymer or the anti-cling surface treatments that the polymer suppliers may be applying. DD is supported by EPSRC and Dow Corning Plasma Solutions.

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