Abstract Submitted
for the GEC16 Meeting of
The American Physical Society

Simulation of Discharge Production in a Water Vapour Layer on an Electrode. MOHAMMAD KARIM, BENJAMIN EVANS, LEONIDAS ASIMAKOULAS, KENNETH STALDER, THOMAS FIELD, BILL GRAHAM, Queen's University Belfast, N.Ireland, TOMOYUKI MURAKAMI, Seikei University, Tokyo, Japan — Electrical discharges in water are receiving increasing attention because of chemical, environmental and biomedical applications.The work to be presented focuses on plasmas created directly in high conductivity water, saline solution. Here the plasma is produced at low voltage (˜200V) and is clearly associated with an initial vapour layer on the electrode surface that isolates the electrode from the liquid. In a previous paper (1) a finite element multi-physics program, incorporating all relevant electrical and thermal properties of the solution was shown to reproduce the experimentally observed pre-plasma vapour layer behaviour. The results of a simulation of the plasma production in vapour layers of the same size and shape as predicted in (1) will be presented, At present inert gas fills the "vapour layer". However this produces spatial distributions of the electron parameters that are consistent with the electric fields predicted in the original simulations. The water plasma simulation recently developed by Murakami is currently being included. It is anticipated that results of the coupled codes, showing the temporal and 2-D spatial development of the vapour and plasma, will be presented. (1) L. Schaper, W.G. Graham and K.R. Stalder, *Plasma Sources Sci. Technol.* **20** (2011) 034003.

Will Graham
Queen's University Belfast, N.Ireland

Date submitted: 13 Jun 2016 Electronic form version 1.4