



Contribution ID: 11

Type: Oral

An integrated approach to understanding RF vacuum arcs

Friday 12 March 2021 17:15 (30 minutes)

Almost 120 years after the isolation of vacuum arcs, the exact mechanisms of the arcs and the damage they produce are still being debated. We describe our simple and general model of the vacuum arc that can incorporate all active mechanisms and aims to explain all relevant data. Our four stage model, is based on experiments done at 805 MHz with a variety of cavity geometries, magnetic fields, and experimental techniques as well as data from Atom Probe Tomography and failure analysis of microelectronics. The model considers the trigger, plasma formation, plasma evolution and surface damage phases of the RF arc. This paper also examines how known mechanisms can explain the observed sharp field dependence, fast breakdown times and observed surface damage. We update the model and discuss new features while also pointing out where new data would be useful in extending the model to a wider range of frequencies.

Primary authors: NOREM, Jim (Argonne Labs (retired)); Dr INSEPOV, Z. (Nazarbayev University); Dr HASSANEIN, A. (Purdue University)

Presenter: NOREM, Jim (Argonne Labs (retired))

Session Classification: Modelling and simulations