8th International Workshop on Mechanisms of Vacuum Arcs (MeVArc 2019)



Contribution ID: 108

Type: Poster

COMSOL simulation of the surface flashover in a MEMS insulator

Monday 16 September 2019 15:20 (10 minutes)

This research is on the COMSOL simulation of flashover occurring in a MEMS (Micro-Electro-Mechanical System) insulator and electrode unit, both of the electric field at triple point and of electron trajectories in several practical geometries. In some applications of MEMS technology, electrostatic field up to 5-20kV/mm is of interest. One of these applications is using MEMS components for manufacturing compact electrostatic lenses or apertures to be used in Scanning Electron Microscopes. High voltage insulation is still one of the challenges, as it is in a conventional construction using metal and ceramic to make lenses and apertures. The field strength at triple points is assessed first, and a glass sphere is added as a dielectric particle later to check the effect of particles in a system. Moreover, a secondary electron emission avalanche (SEEA) model is utilized in the simulation. Electrons are assumed to be emitted from the sphere by the mechanism of cold field emission or ionisation. The secondary electrons collected by the electrode on the positive side are recorded, and the multiplication factor is compared for these geometries. Among these geometries, a two-step structure seems to contradict experimental results published before. We try to explain the differences.

Authors: GUO, Xiaoli; KRUIT, Pieter (Delft University of Technology)

Presenter: GUO, Xiaoli

Session Classification: Field Emission - Modeling and Simulations

Track Classification: Modeling and Simulations