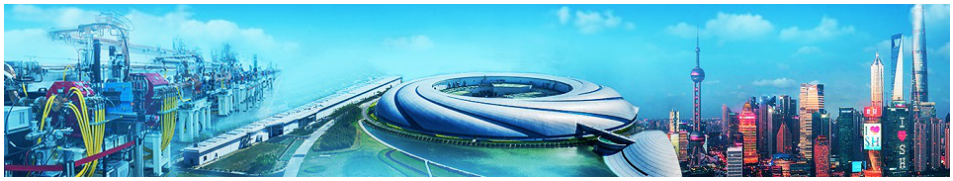

Contribution ID: **41** Type: **not specified**

Theoretical understanding of mechanisms triggering vacuum breakdown

Thursday 7 June 2018 09:25 (25 minutes)

Application of electric fields on metal surfaces may be beneficial and detrimental. In our research, we are looking for the changes on the surface, which may lead to vacuum arcing, known to those who are dealing with the high/voltage electronics as electrical breakdowns. These cause problems in many appliances operating in high electric field, such as the Compact Linear Collider (CLIC), a proposed next-generation particle accelerator in CERN. The breakdown phenomenon is not well understood despite decades of research devoted to investigation of this phenomenon.
What triggers the surface to break when high electric fields are applied is the focus of the research in our group. Currently we are working on an atom-level theoretical model of surface behavior under high electric fields. The model covers many stages of plasma development and includes different physical processes evolving on different time scales. Our model aims to explain the physical limitation of a metal surface due to electrical breakdowns at the fields well below the critical values known to cause field evaporation of atoms. The core of the model is the atomistic simulations of metal surface features under high electric field, which will be presented during the workshop along with the obtained results.

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