

Seminar

Institute for Plasma Research

- Title :** Study of surface flashover of insulator in gases at high pressure
- Speaker :** Mr. Somesh Vinayak Tewari
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- Date :** 27th March 2015, Friday
- Time :** 03.30 PM
- Venue :** Seminar Hall, IPR

Abstract:

Spacers are used as solid insulating support structures for HV conductors in a gas insulated system. Spacer-gas interface constitutes the electrically weakest location in the system. The high voltage pulse power system constitutes a number of composite dielectric interfaces like the solid-liquid, solid-gas and solid-vacuum interface. However surface flash over along the gas- solid interface in pressurized spark gaps and in support insulators is a major problem in the operation of the high voltage pulse power systems. Further an efficient design of spacer is required in order to achieve higher spacer efficiency and also minimize the problem of surface flashover. The research focuses on development of a model to study discharge along gas-solid interface under nanosecond time regime using particle-in-cell code with a spacer efficiency of nearly 81% in an insulator bridged gap [1]. The work involves the study of discharge characteristics by varying insulator geometries to optimize the insulator geometry with maximum spacer efficiency and the effect of spacer surface protrusions on spacer efficiency. The maximum efficiency of 97% has been achieved for negative angled and bushbar spacers [2]. A compact Marx generator based on pulse forming network is developed which is utilized as a pulsar for high pressure surface Flashover studies [3, 4]. Furthermore surface potential decay experiments are carried out on Polymethyl methacrylate (PMMA) and Polyoxymethylene (POM) spacers to study the effect of potential decay on insulating material surface and the analysis is carried out based on length of the polymeric chain [5]. Finally optical emission spectroscopic experiments are carried out on particle contaminated spacer surface to further get an insight into the breakdown process using atomic spectra lines. These results illustrate presence of H α lines in the presence of an insulator with a reduction in plasma temperature from 0.44eV to 0.437eV and increase in electron density with increase in distance of particle contamination from cathode [6].

REFERENCES

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