Contribution ID: **228** Type: **Poster Presentation**

Space Charge Accumulation as a Contributor to Partial Discharge Activity in Dielectric Elastomer Actuators under High Voltage DC

Wednesday 6 July 2016 14:40 (20 minutes)

Space charge accumulation is theorized to be a contributor to partial discharge activity. The analysis of partial discharge (PD) activity is a method of predicting electrical breakdown in dielectric materials. Rapid aging tests of an acrylic dielectric elastomer using a partial discharge analyzer (PDA) has shown that under DC voltage application consisting of a 1 minute period of constant voltage followed by an increase in voltage step results in bursts of partial discharge activity. This paper will explore the potential cause of this phenomenon. It is theorized that space charge accumulation during the constant voltage period followed by rapid charge injection during the increase of voltage results in an impulse like stress of the elastomer causing PDs. Using the pulsed electro acoustic (PEA) method, space charge measurements are collected and compared to partial discharge occurrence data to analyze the correlation between PD occurrence and space charge presence.

Author: Mr FRANCIS, Akeem (University at Buffalo)

Co-authors: Dr ZIRNHELD, Jennifer (University at Buffalo); Dr BURKE, Kevin (University at Buffalo)

Session Classification: Poster 1-C

Track Classification: Dielectrics, Insulation, and Breakdown