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## **M3Or2A-03 [Invited]: Effect of Non-Uniformity of Electric Field on Breakdown Strength of Cryogenic Gaseous Insulation Media for Superconducting Power Applications**

*Wednesday, July 24, 2019 12:00 PM (30 minutes)*

A new experimental set up for measuring the breakdown strength of gas media in non-uniform electric field at cryogenic temperatures and high pressures is described. Measure of breakdown strength of helium gas at 77 K and 293 K in a non-uniform electric field with a field efficiency factor 62.5% are presented. The results suggest that the breakdown strength in non-uniform electric field relate to that of uniform electric field by the field efficiency factor,  $\eta$ . This relationship holds good for both 293 K and 77 K data. This observation expands our previously reported systematics of dielectric strength in uniform electric field to the non-uniform electric field conditions, which is important for designing HTS power applications. The established relationship eliminates the need for costly experiments for measuring the dielectric strength at a specific operating temperature and pressure and in the required non-uniformity of the electric field.

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