

The realization of the High Voltage Short Gap Test Facility

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Voltage holding in vacuum is one of the most critical issues for the experiment MITICA (Megavolt ITer Injector & Concept Advancement), aimed at realizing of the 40 A – 1 MegaVolt prototype of the ITER HNB at the Consorzio RFX in Padova. For this reason, boosting the R&D on this specific problem has been identified as a priority to attain the success of the MITICA experiment. To this purpose, a dedicated High Voltage Test Facility to test electrodes separated by Short vacuum Gaps (HVSGTF) has been realized, aiming at studying the fundamental mechanism related to Fowler-Nordheim electron emission which are at the basis of the voltage breakdown.

HVSGTF is designed to carry out experiments up to 100 kVdc with metal and non metal electrodes in high vacuum and separated by gaps in the range from 0.1 to 2 mm.

This configuration allows the study of field emission from real surface, in the framework of the recent theoretical model (Breakdown-Induced by Rupture of Dielectric – BIRD model) elaborated at the Consorzio RFX, with high electrode electric field but with low voltage, so that the total voltage effect results almost suppressed.

This contribution describes the technical details of the facility, the architecture of the control system, and the results of the commissioning.

Preference:

Poster

Topic:

Fusion Technology

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