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Type: **oral**

Study of vacuum RF breakdown in strong magnetic fields

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RF breakdown has a negative impact on a RF cavity's performance, especially with the presence of strong magnetic fields. This issue can arise in designs of muon ionization cooling channel, RF guns, klystrons and in many other applications. The MuCool Test Area at Fermilab is the facility that allows us to study the effects of static magnetic field on RF cavity operation. As a part of this research program, we have tested an 805MHz pillbox-like "modular" cavity in strong external magnetic fields. "Modular" structure of the cavity enables easy dismounting of the endplates to perform inspection of inner surfaces after each run as well as swapping endplates to study the effects of various materials on breakdown phenomenon. Surface inspection after high power runs of modular cavity with flat copper end walls in zero and 3T magnetic fields revealed unique damage patterns. High power runs with Be end walls allowed us to test behavior of lower radiation length material in external magnetic field and directly measure field emission properties. Analysis and results of both material configurations will be presented.

Type of contribution

Oral

session

Applications - materials and devices

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