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Study of RF Breakdown in Strong Magnetic Field (15' + 5')

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RF cavities are essential components of almost every particle accelerator. Among other limitations, cavity gradients are restricted by occasional sparking inside the cavity, or RF breakdown. It has been shown that presence of external static magnetic field aggravates the influence of breakdown on performance of the cavity. This problem can arise in designs of muon ionization cooling channel, RF guns, klystrons and other applications. The MTA area at Fermilab is the facility that allows us to study the effects of static magnetic fields up to several Tesla on RF cavity operation. As a part of this research program, we have tested "modular" cavity in strong external magnetic fields. The special design of the cavity allowed for easier inspection of the cavity, swapping endplates with different materials and hence better control over sources of systematic errors. I will present results of high-power tests of "modular"cavity with and without external multi-Tesla magnetic field.

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