15th Workshop on Breakdown Science and High Gradient Technology (HG2023)



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The INFN MICRON project at LNF: Development of high-gradient metallic mm-wave accelerating structures.

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The exploration of procedures, materials, technological methods, and welding techniques applied in the production of high-acceleration components to achieve an exceeding accelerating gradient (>100 MV/m) and minimal occurrence of RF breakdown, has guided us towards proposing the utilization of hard-copper structures composed of multiple segments in the Ka-Band spectrum. Among research applications, we mention the study of RF Breakdown Rate and RF Breakdown Physics; electron beam longitudinal phase-space manipulation in FELs; multi-frequency accelerators; development of single and multi-frequency high-power RF klystrons.

In this talk, we detail our investigation into TIG welding evaluations, encompassing both visual scrutiny and temperature surveillance, concerning metallic RF cavities operating in the Ka-band frequency. These examinations, from which several facets of the welding process were taken as benchmarks, encompass both two-half and four-quadrant models.

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