

11th International Workshop on Thin Films and New Ideas for Pushing the Limits of RF Superconductivity - TFSRF2024



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Status of HIPIMs developments at CERN

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The SRF cavities made with a niobium coating on a copper substrate (Nb/Cu) offer several advantages over those made with bulk niobium. This is mainly attributed to the excellent thermal properties of copper, enabling operation at higher temperatures and consequently reducing cryogenic costs. The Nb/Cu technology has been employed at CERN since the 1980s, being currently used in the LHC and HIE-ISOLDE SRF systems. Furthermore, it has been chosen as the baseline for the FCC accelerator. Despite the advantages, a systematic degradation of the performance at high accelerating gradients has been historically observed. To comprehend and address this degradation, a vast R&D program has been carried out at CERN in recent years. The main objective was to identify an optimized recipe to manufacture these cavities, while ensuring scalability to meet the extensive requirements of the FCC project. Initially, for selecting the best coating deposition technique, small flat samples were tested using a quadrupole resonator. Once determined, these coatings were applied to 1.3 GHz cavities. Different manufacturing techniques were explored for producing the copper substrates too. This presentation offers an overview of the progress and the current status of the research campaign.

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