Contribution ID: **68** Type: **Invited Talk**

Compact, cost effective, advanced electron accelerators

Friday 19 September 2025 09:00 (25 minutes)

There is a strong demand for innovative RF structures to qualify within the global scientific collaboration—including SLAC, CERN, INFN-LNF, KEK, and Tsinghua University—dedicated to R&D in accelerator development and high-power RF testing of advanced cavities with increasingly higher gradients. This research explores various geometries, materials, surface processing techniques, and technological advancements in X-band (11–12 GHz) accelerating structures, aimed at next-generation linear particle accelerators for scientific research as well as industrial and medical applications.
We present the current status of our activities at INFN-LNF, focusing on X-band research through the ASTERIX project and Ka-band (35–36 GHz) investigations under the MICRON project, both funded by INFN Committee CSN5. The recently approved ASTERIX project is dedicated to designing, fabricating, and high-power RF testing of the first practical, meter-long, braze-free X-band RF linac for real linear accelerators. This structure consists of four-quadrant ("open-type") hard copper components, engineered to achieve accelerating gradients exceeding 100 MV/m. Meanwhile, within the MICRON project, we introduce the RF design, fabrication, and preliminary measurements of ultra-compact, braze-free RF cavities assembled from multiple parts and powered via a mode launcher. These structures are designed to achieve even higher accelerating gradients and function as RF linearizers.

Abstract Category

Accelerators

Author: FAILLACE, Luigi

Presenter: FAILLACE, Luigi

Session Classification: Cross-cutting fields

Track Classification: Physics Research