Contribution ID: **2** Type: **not specified**

Synergistic Studies on Superconducting RF Cavities for Accelerator, Quantum Information Science, and Dark Matter Search Applications

Monday 5 June 2023 13:00 (5 minutes)

Superconducting radio-frequency niobium cavities are the most efficient electromagnetic resonators ever engineered and serve as an enabling technology for highly efficient particle accelerators, ultra-long lifetime platform for quantum information science, and an ultra-sensitive detector for elusive dark matter searches. As a result, any performance improvement in these cavities may translate into a dramatic simultaneous increase in scientific reach in the fields of particle, accelerator, and quantum physics. The realization of this performance enhancement requires basic studies focused on identifying loss mechanisms and developing mitigation strategies. Studies which correlate materials observations to RF performance of variously processed superconducting and dielectric materials are necessary to gain a full understanding of the role of impurities, oxides, and crystal structures. This will then feed into the development of processing techniques that further improve performance. Moving forward, emphasis must be placed on developing expertise which lies at the intersection of material science and RF engineering.

Primary author: BAFIA, Daniel

Presenter: BAFIA, Daniel

Session Classification: Contributed talks