

The Beams and Applications Seminar Series

The Design of Superconducting Half-Wave Resonators for the Facility for Rare Isotope Beams (FRIB)

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Bldg. 401, Room B-4100

Wednesday February 8, 1:30 pm

Host: Ali Nassiri

Abstract:

Advanced heavy ion/rare isotope accelerators present very different challenges compared to traditional electron and proton machines. The range of particle velocities that must be accepted for a wide variety of accelerated ions implies a robust system of various accelerating cavity types. The Facility for Rare Isotope Beams (FRIB) project requires such a system and research and development of new techniques and technologies to address these issues in a timely and practical manner have been undertaken at Michigan State University (MSU). While the low-energy section of the FRIB linear accelerator uses more established superconducting Quarter-Wave Resonators (QWRs), the decision was made to pursue two different types of superconducting Half-Wave Resonators (HWRs) for high-energy accelerating section of FRIB. In this talk, a brief overview of the FRIB project and its use of HWRs will be given, along with the relevant theory of superconducting accelerator cavities. The interaction between simulation, mechanical design, and fabrication will be highlighted as essential to achieving a cavity design with reliable, repeatable performance. Results of a cavity test performed at MSU will be presented as an example of this process.

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