BARC

CHINTAN BAITHAK

brainstorming science & technology for cutting edge in-house R&D

@High Intensity Proton Accelerators

Roadmap

High Intensity Proton Accelerators (HIPA)

- Normal Conducting Low Energy Front End upto 10-20 MeV: LEHIPA
- Superconducting Medium Energy Section: upto 200 MeV: MEHIPA
- Superconducting High Energy Section: ~1 GeV: HEHIPA

High Intensity Proton Accelerators delivering proton beam of around 1GeV energy would play a key role in nuclear energy sector and specifically in the realization of Accelerator Driven Sub Critical System, nuclear waste incineration and advancing utilisation of thorium in nuclear reactors. The first step on the path of High Energy High Intensity Proton Accelerator (HEHIPA) has been successful demonstration of 20 MeV energy in indigenously developed Low Energy High Intensity Proton Accelerators (LEHIPA). BARC is also significantly contributing towards construction of 800 MeV Proton accelerator at Fermilab National Laboratory. Both these endeavors have boosted the confidence in moving ahead with constructing 200 MeV Medium Energy High Intensity Proton Accelerator (MEHIPA) at BARC, Visakhapatnam. Subsequently, Super Conducting Elliptical type cavities will be developed to reach 1 GeV. The fabrication and design of these cavities would be on similar concepts adopted for Fermilab Proton Improvement Plan (PIP)-II project.

Applications

- Advanced physics & material science research.
- Nuclear physics studies
- Radioactive Ion Beams
- Rare Radio Isotopes
- Medical research
- Demo ADSS
- Accelerator Driven Systems (ADSS)
- Spallation Neutron Sources (SNS)

Technologies Developed

- Normal Conducting Accelerating Structures: RFQ, DTL
- High Current Ion Source
- Regulated High Voltage Power Supply
- LLRF, RFPI, Control & Interlock System
- Beam Diagnostics
- Magnets
- Liquid Helium Plant
- RF Amplifiers
- RF Couplers
- Super Conducting Cavities

Speaker
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