**Introduction & Motivation**

- Electron beam ion source (EBIS) is a device used for the production of highly charged ions by electron impact ionization. An EBIS test bench has been constructed to extract ion beams of desired species in desired charge states.
- A Wien filter is designed and manufactured to resolve He\(^{+}\) / Ar\(^{+}\) ions produced from the EBIS.

**EBIS test bench**

- In the EBIS test bench, we also install a short pulse electronics unit to generate ion beams with short pulse widths.
- We also have a plan to install a superconducting EBIS (EBIS-SC) for a 100 MeV proton linac.
- A 7 T EBIS is developed as an ion source for a 200 MHz RFQ for low energy ion beam applications. Electron beam simulation is on progress.
- We present three plans for EBIS's at KOMAC: EBIS-A test bench, EBIS-SC for the 100 MeV proton linac, and 7T EBIS for the low energy ion beam applications.

**Short Pulse Electronics unit (SPE unit)**

- To generate short ion pulses, SPE unit is installed, shown in red dashed box.
- As extraction time is varied from 0.5 to 10 μs, ion charge and ion pulse width are measured (above graphs.)

**Wien filter**

- A Wien filter is designed and manufactured.
- Resolved Ar\(^{+}\), Ar\(^{+}\)\(^{2}\) and Ar\(^{+}\)\(^{3}\) ions.

**Short pulsed ion source for a 100 MeV proton linac at KOMAC**

- Electron current = 400 mA
- Superconducting magnet = 6 T
- Proton beam current = 610 pC / pulse
- Proton pulse width < 1 μs

**Electron beam simulation for a 7 T EBIS**

- 7T EBIS has two magnets, viz a bucking coil at the electron gun and a superconducting magnet at the drift tube region.
- The entire simulation is done by TRAK code.
- Full transmission till the center of 7 T superconducting magnet.

**Conclusion & Future scope**

- We characterized our EBIS-A test bench with a newly installed Wien filter and a short pulse electronics unit.
- Plans for short pulse ion source for the 100 MeV proton linac at KOMAC is explained.
- Electron beam simulation for the 7 T EBIS is discussed. Electron beam is transmitted till 7 T region at the center of the EBIS.

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