Workshop on Accelerator Operations, September 10 – 15, 2023, Tsukuba, Japan

The Operation Status of Linac and Multi-beamlines and Beam Tuning Procedure for Beam Service

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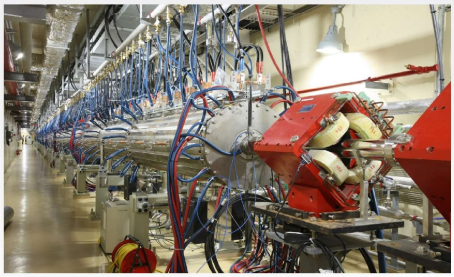
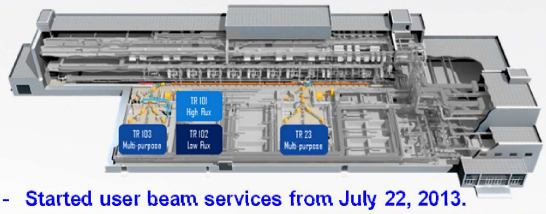
Linac & Beamline Operation



Features of KOMAC 100 MeV linac

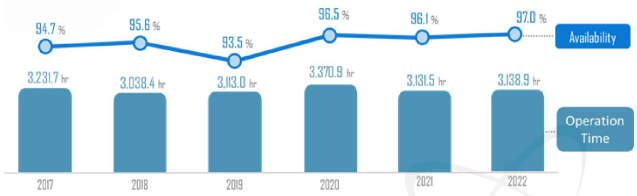
- 50-keV Injector (Ion source + LEBT)
- 3-MeV RFQ (4-vane type)
- 20 & 100-MeV DTL
- RF Frequency : 350 MHz
- Beam Extractions at 20 or 100 MeV
- 5 Beamlines for 20 MeV & 100 MeV



- Started user beam services from July 22, 2013.
- Total 6 beamlines were installed (1 for 20 MeV, 5 for 100 MeV)
- 4 beamlines are operating for beam service (TR23, TR101, TR102, and TR103)

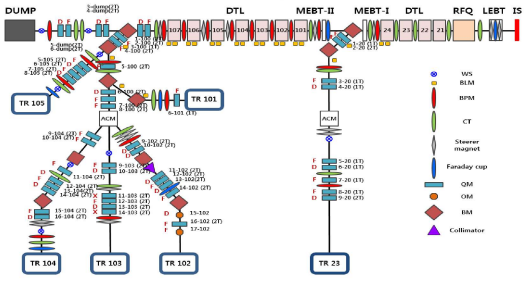
Operation Status

◆Total accumulated operation time : 30,087 hours
◆Average Operation time (during 5 years) : 3,158 hours
◆Average availability : 94.7%



◆ Annual Operation (52 Weeks)

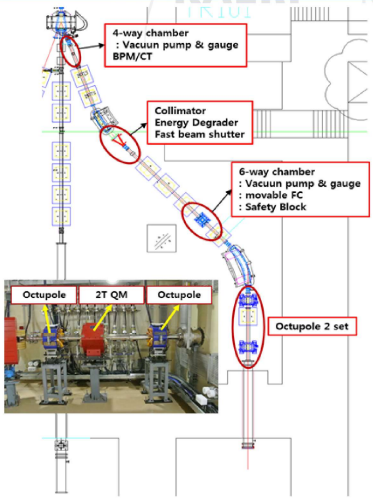
- 28 weeks for beam service
- 7 weeks for Machine study
- 17 weeks for Maintenance
- Beam service : Monday 13:00 ~ Friday 18:00
- Operation shift
  : 1 for linac
  : 2 for beam line



BL102 : Low Flux Proton irradiation test facility

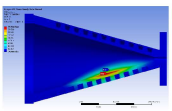
❑ Layout

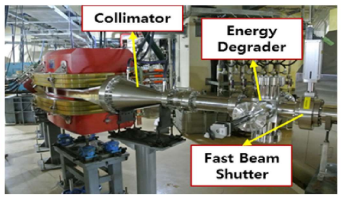
- Low peak current
- Low flux proton
  - by collimator
- Beam energy adjustment
  - Double wedge type energy degrader
- Uniformity at the target
  - Octupole magnets
- Stable beam on/off
  - By fast beam shutter



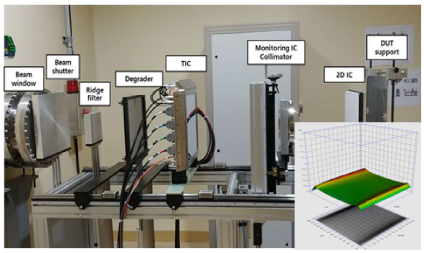
◆Collimator

- 50 mm off axis -> 1/1,000 reduction
- Beam absorber : Graphite
- Cooling jacket : Copper
- Aperture : dia. 10 mm





◆Proton irradiation Facility



Incident Proton Energy	33, 45, 57, 69, 81, 92, 102
Available Proton Energy	20 ~ 100 MeV
Typical fluence	1E6 ~ 1E8 [#/cm2-sec]
Typical Irradiation area	100 mm × 100 mm
Uniformity	< 10%

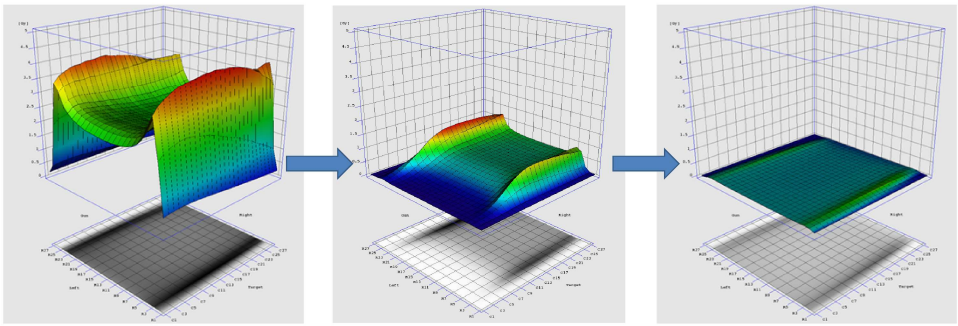
● BL102 can provide sufficient large proton beam for various size DUT's

Beam Tuning Procedure for BL102

◆ Achieve the high beam current by BL102 CT & FC (to obtain the centered beam at Octupole magnet)

◆ Adjusting beam intensity by user demand
: make the off-centered beam at collimator
: by steerer magnet & bending magnet
: in-situ beam profile & intensity monitored by 2D Ionization chamber detector

◆ For fine control of beam shape & intensity
: adjust the octupole & quadrupole magnet



Flat & high flux beam | Off-centered beam | Flat & low flux beam

Acknowledgement: This work has been supported through KOMAC (Korea Multi-purpose Accelerator Complex) operation fund of KAERI by MSIP (Ministry of Science, ICT)