Improvement towards reliable beam operation in Indus-2 storage ring

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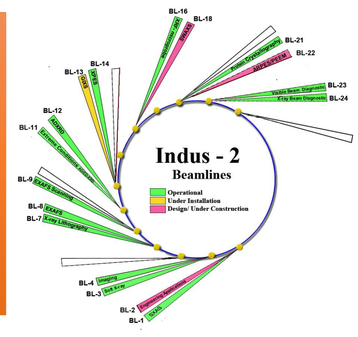


ARW 2017
Accelerator Reliability Workshop

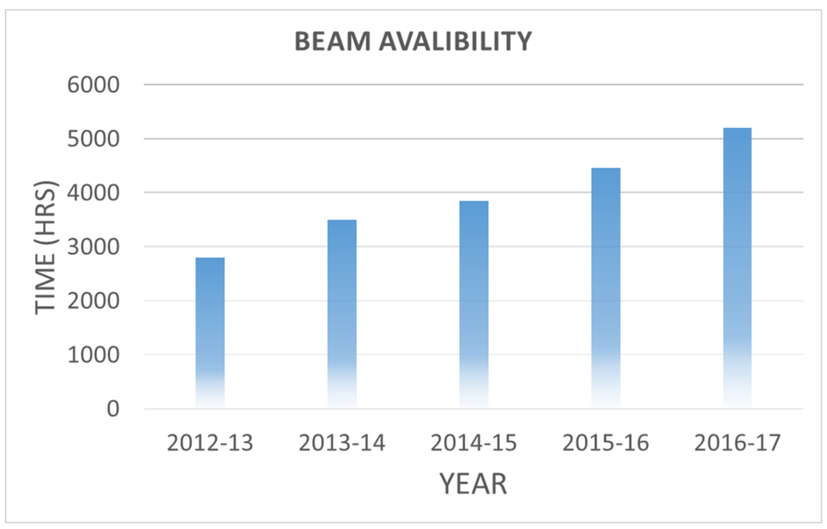
Indus-2 is a 2.5 GeV Synchrotron Radiation (SR) source, indigenously developed, delivering photon beam to SR users in round the clock mode since 2010.

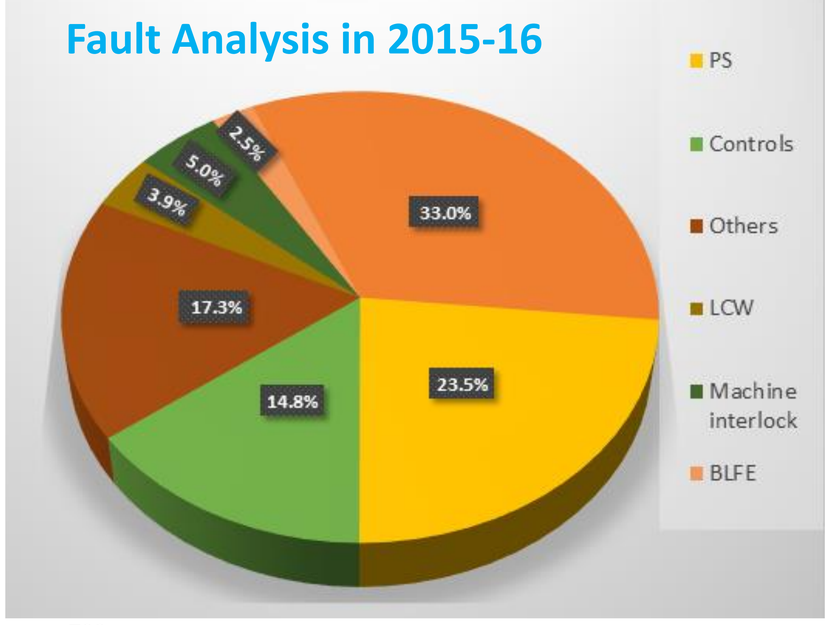
It is operated by trained operators, who are capable of handling faults in the machine at any time and that helps in reducing the machine downtime

Presently, 13 beamlines are operational and the number of users increases every year and it reached 600 in the year 2016.

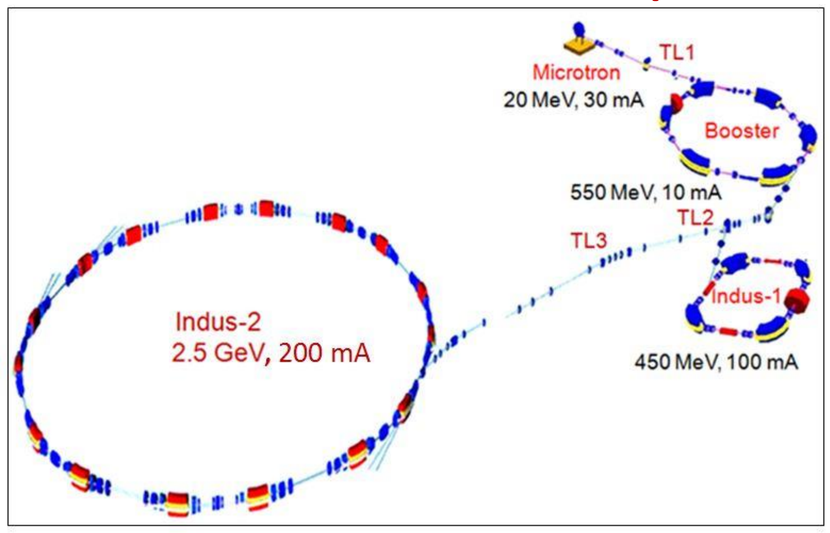
The status of Indus-2 facility which is continuously being upgraded and progress towards reliable operation is discussed

Operation Statistics

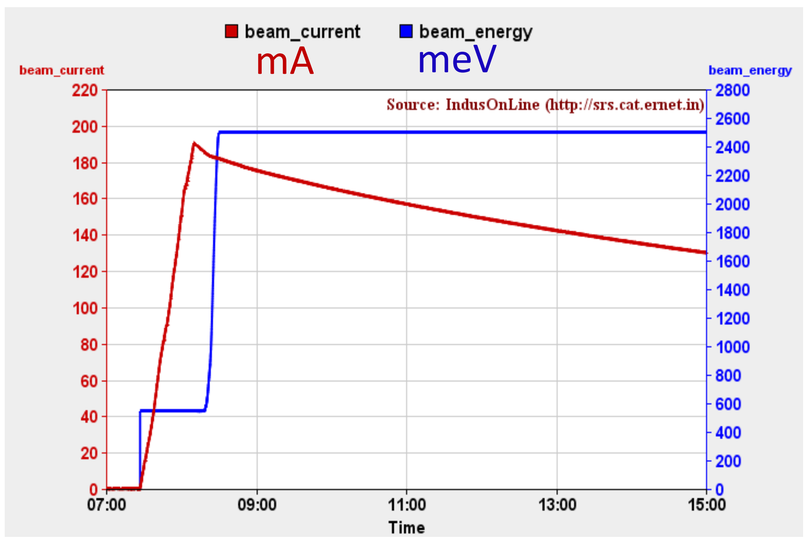


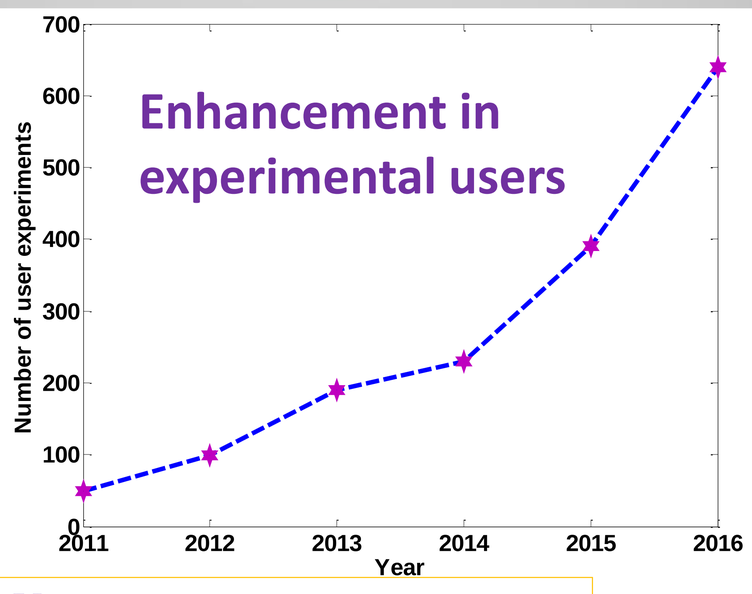


Schematic view of Indus complex



Typical user mode operation

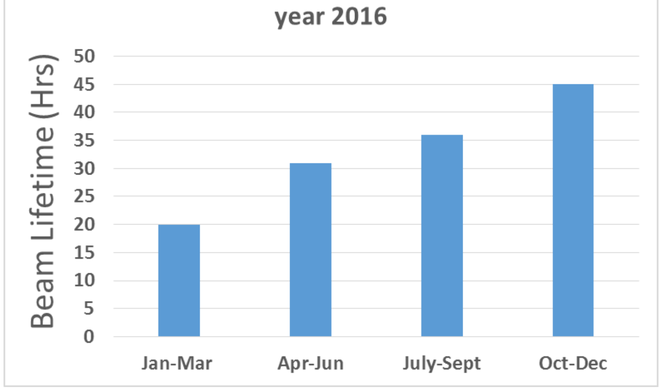




Beam is injected at 550 MeV and ramped up to 2.5 GeV
Time required between beam loss due to failure of any component and restored user mode operation: 2 hrs (Includes magnet p/s cycling)
4 days in every two months is allotted for maintenance
2 days in every month is assigned for machine studies

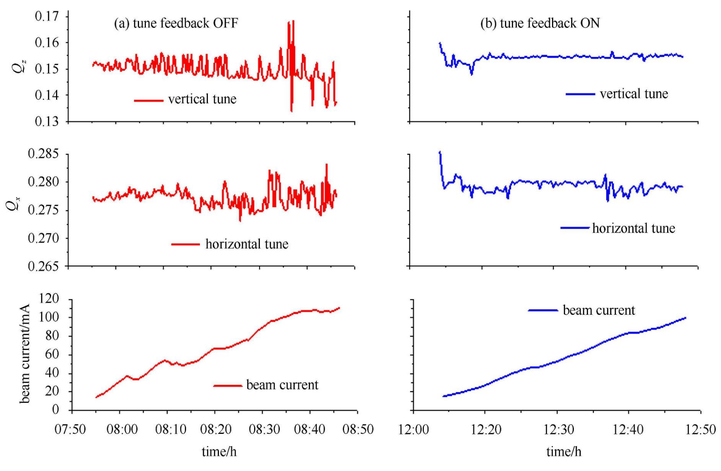
Improvement in beam life time

The vacuum in the injection segment was recently improved from 3e-9 mbar to 5e-10 mbar gradually after the replacement of old injection kicker chambers with new upgraded chamber

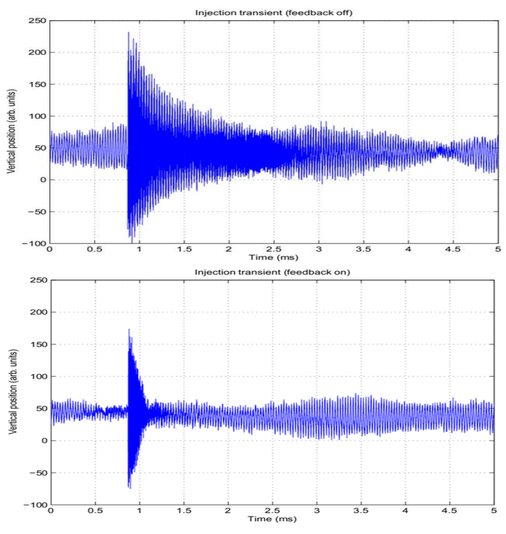


Progress towards stable beam operation

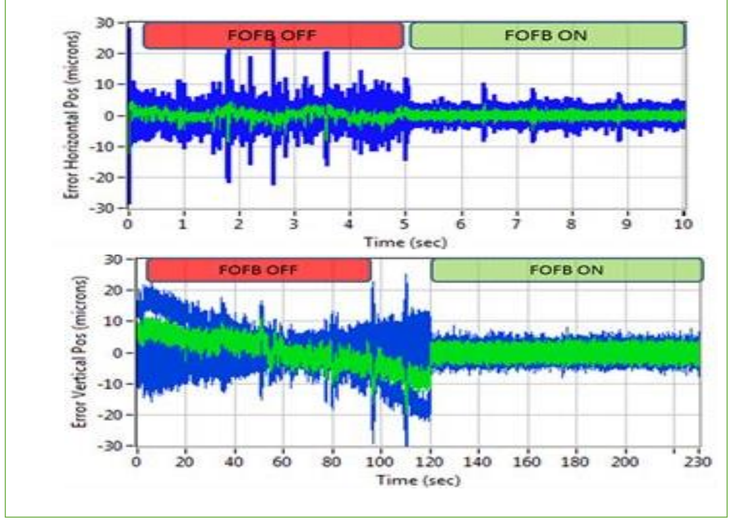
Betatron tune feedback



Transverse multibunch feedback

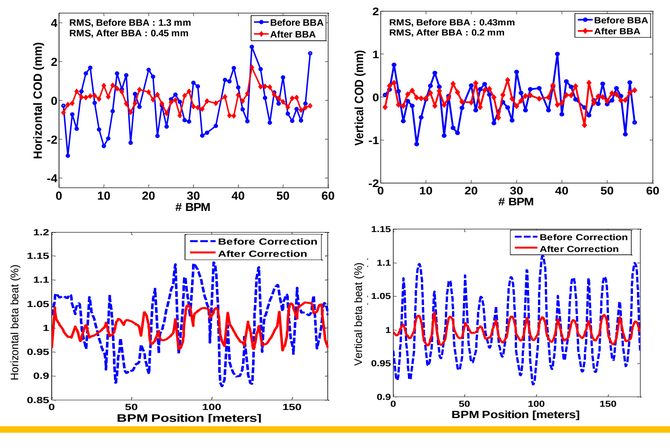


Fast orbit feedback



Performance enhancement

- ✓ Beam based alignment (BBA) (COD correction)
- ✓ LOCO (Optics correction)



- For RF cavity: solid state RF amplifier are developed in-house and used in place of Klystron
- Two planer and one APPLE type undulators are commissioned recently.
- One more RF cavity was recently added to the already existing 4 RF cavity for high current beam operation.