

# Summary slide

## Physics Studies of ADITYA & ADITYA-U Tokamaks Plasmas using Spectroscopic Diagnostics

- Many spectroscopic diagnostic system in visible to VUV are installed on both Aditya and Aditya-U tokamaks
- Poloidal rotational velocity measured using Doppler shifted CIII spectral line at 464.7 nm
- Edge ion temperature measured using CIII spectral line which is  $\sim 40$  eV
- In high magnetic field, spectral line get influenced by Zeeman Effect, taking this in account Hydrogen neutral temperature is measured using H $\alpha$  at 656.28 nm.
- Two temperatures component neutral hydrogen atom found, warm temperature  $\sim 3$ -5 eV, hot temperature  $\sim 15$ -30 eV
- Oxygen impurity transport studies carried out through indigenous development of impurity transport code using semi-implicit numerical method.
- Influxes measured from wall (SS) and limiter (graphite) using PMT diagnostics. Influx measured for hydrogen neutral, Carbon and Oxygen impurity ions. This measurement indicates wall is important source of particle and impurity.
- Visible bremsstrahlung emission measured around 523.0 nm (line free region) ,  $Z_{eff}$  is estimated with this measurement and studied for various type of discharges.
- Investigation of atomic and molecular processes in H $\alpha$  emission done through modelling of measured H $\alpha$  emissivity profile using DEGAS2 code
- VUV spectrometer is used for detailed investigation of Iron impurity behavior in Aditya tokamak, done through iron transport study.