

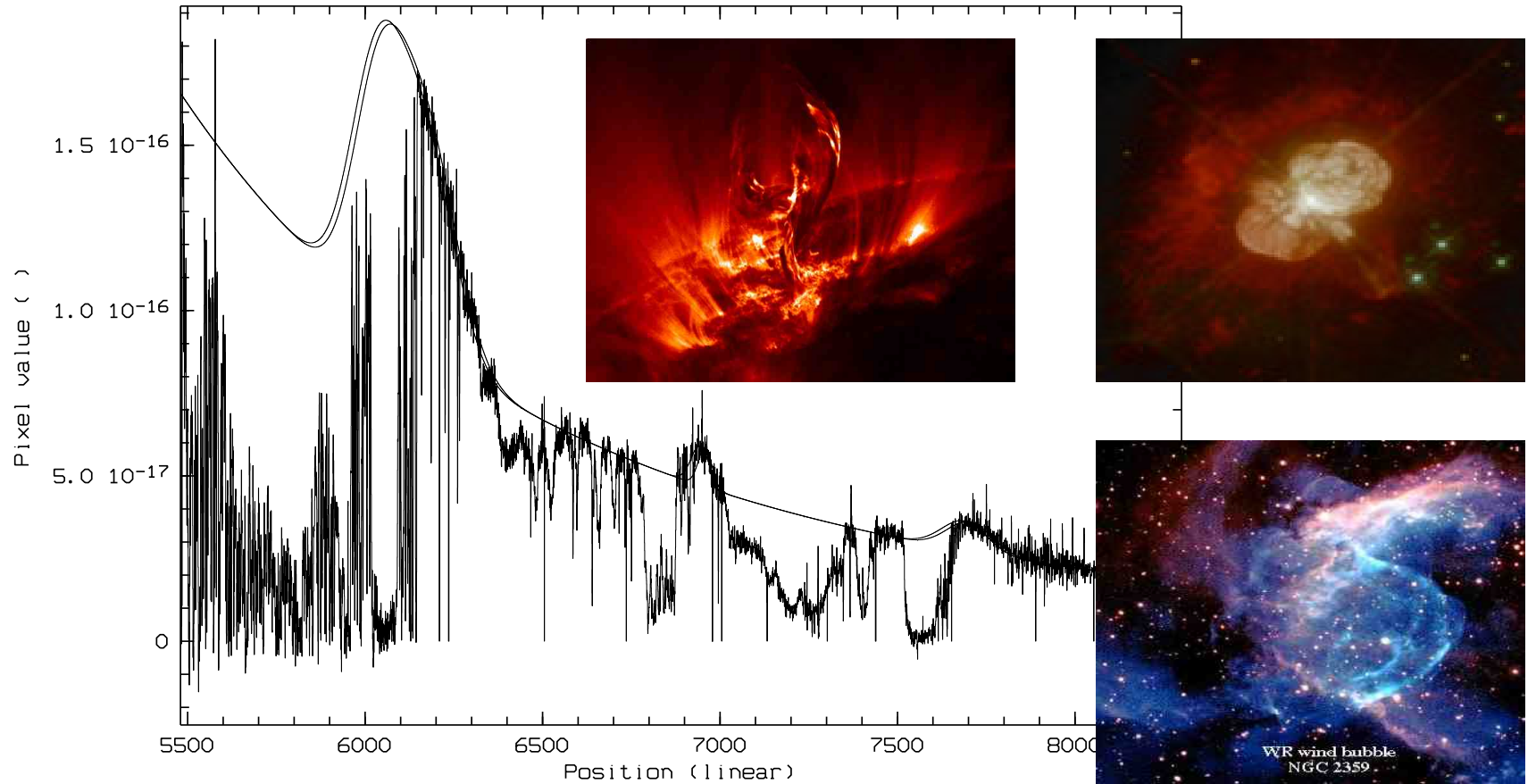
IUCAA's Science Programmes with SALT



Astronomy research @ IUCAA

- QSO absorption lines and IGM: SDSS spectra upto $r \leq 20$ mag available
- Deep field and high-z galaxies: Objects are usually compact and faint
- GRBs and host galaxies: Objects are usually compact and faint
- Morphology of galaxies: Mostly low-z bright galaxies
- Rapid variability of compact objects (X-ray connections)
- Followup of GMRT targets: mainly redshift measurements
- Virtual observatories
- MeerKAT absorption line survey target selection

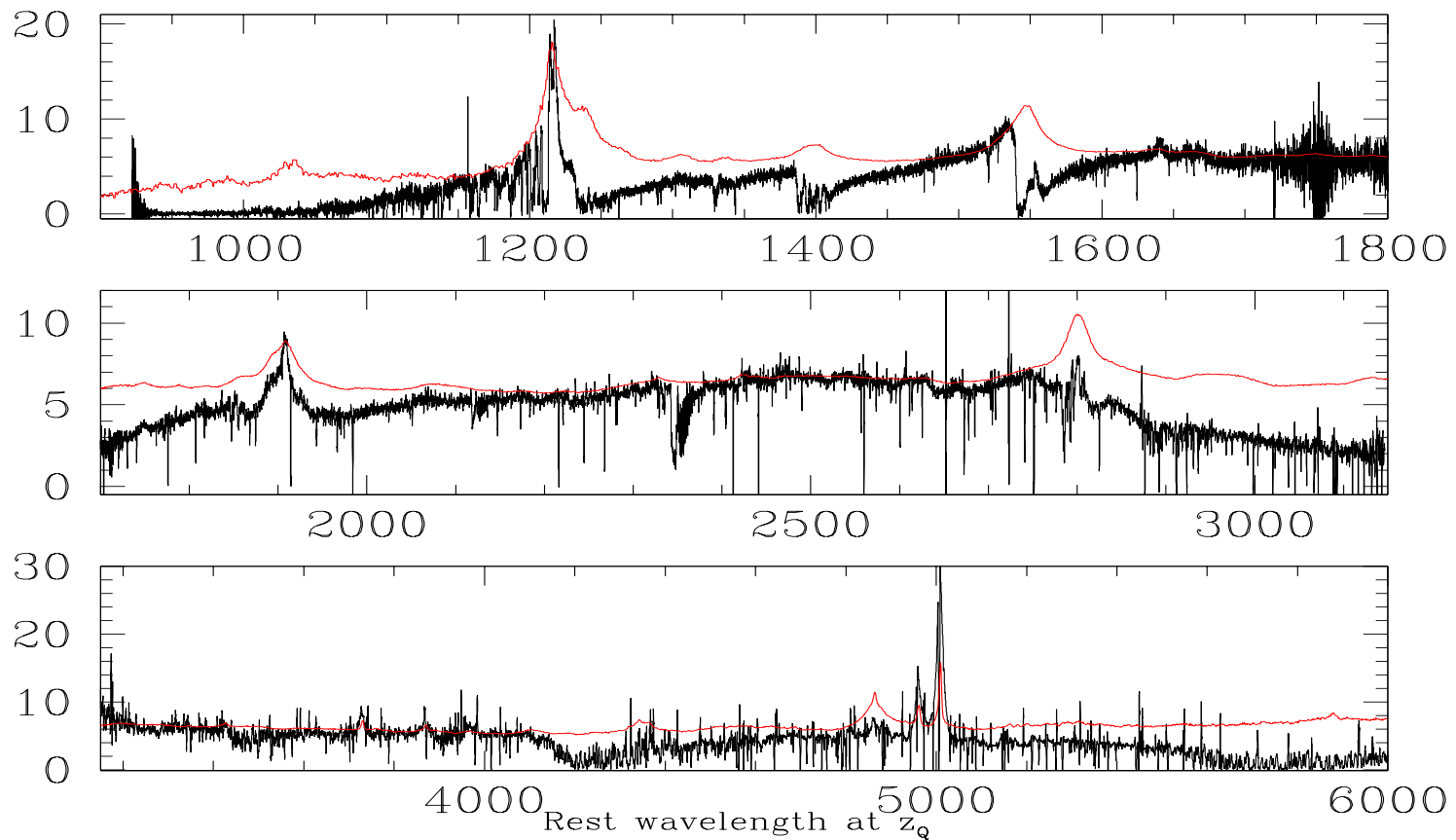
Broad absorption lines: Outflows



Why study associated absorption lines?

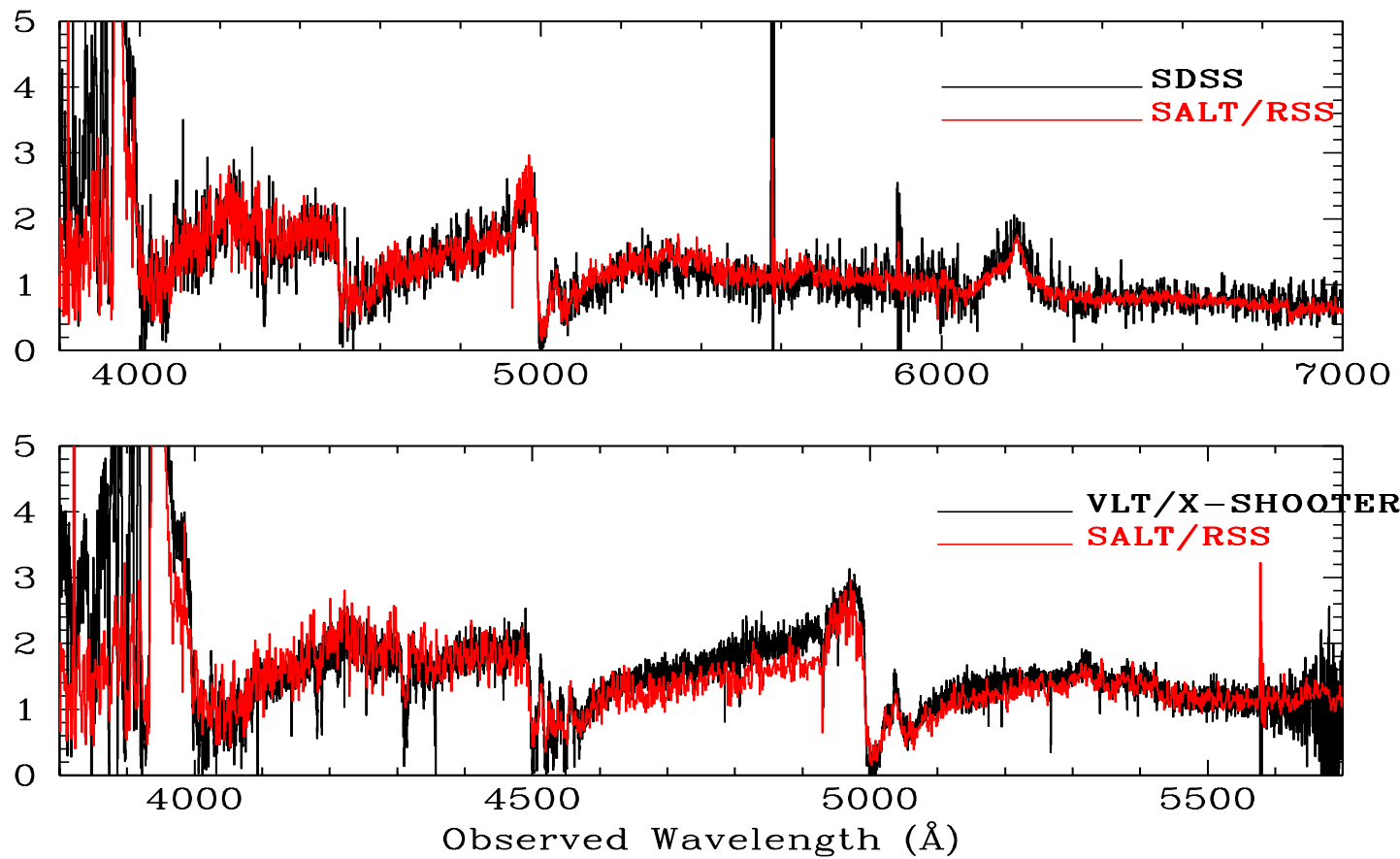
- **Kinematics, dynamics, nature and origin of the flow:**
 - Hydro dynamics, Radiation hydro-dynamics, MHD ?
 - Location, geometry, covering factor, stability and confinement.
- **Chemical enrichment**
 - Nature of star-formation activities in the Galactic centre
 - Starburst - Blackhole connection.
- **Feedback to the structure formation**
 - Heating and enrichment of the IGM.
 - Heating of the intra-cluster medium.
 - Blackhole buldge relation.

Spectrum of peculiar objects



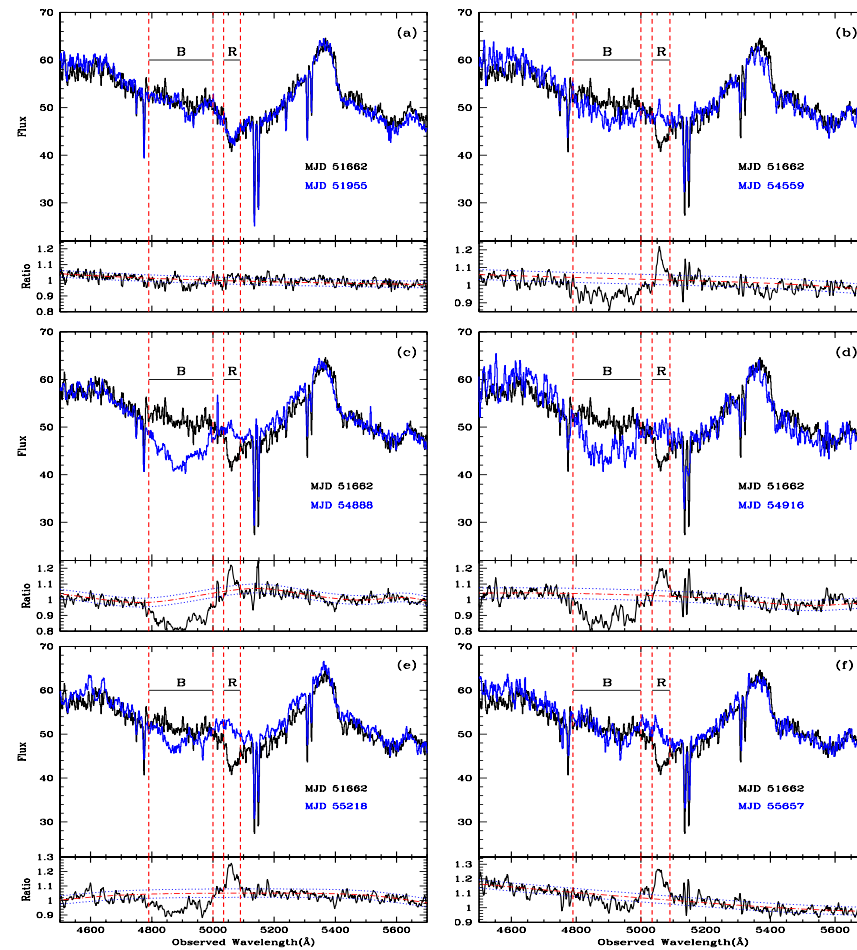
RS in preparation

Spectrum of peculiar objects: RSS/ X-shooter comparison

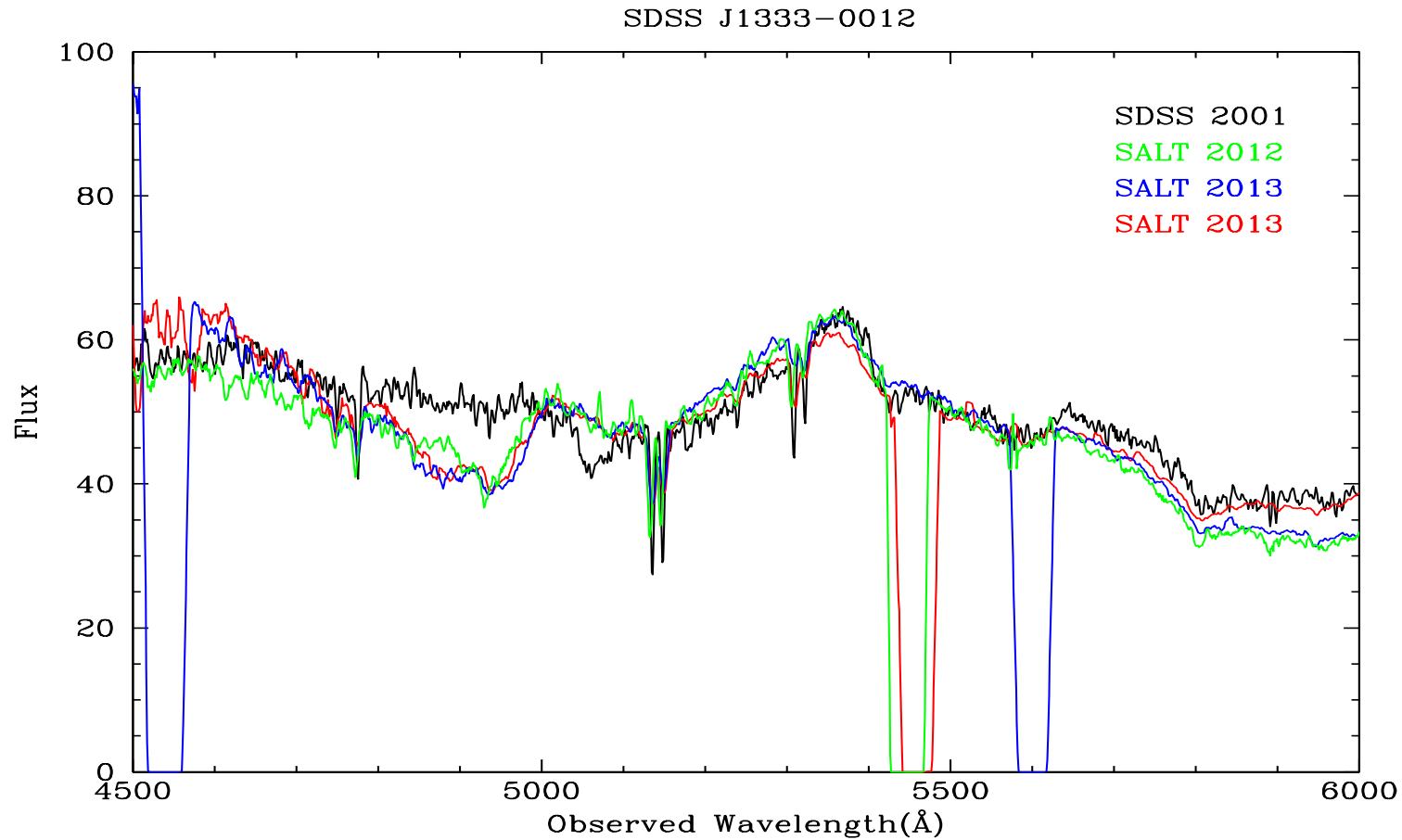


RS in preparation

Variability of Low-ionization BAL QSOs



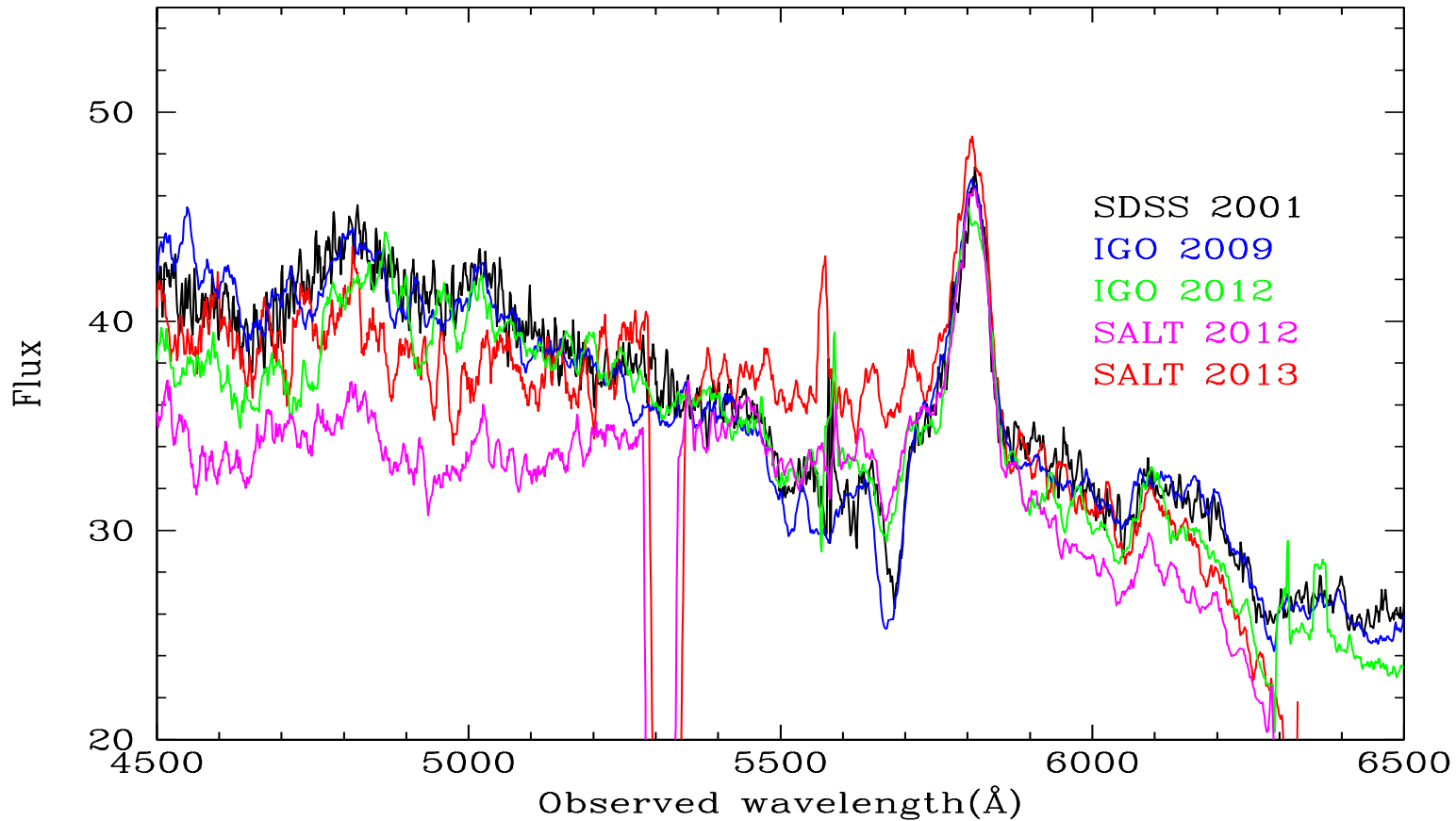
Variability of Low-ionization BAL QSOs



Vivek et al. in preparation

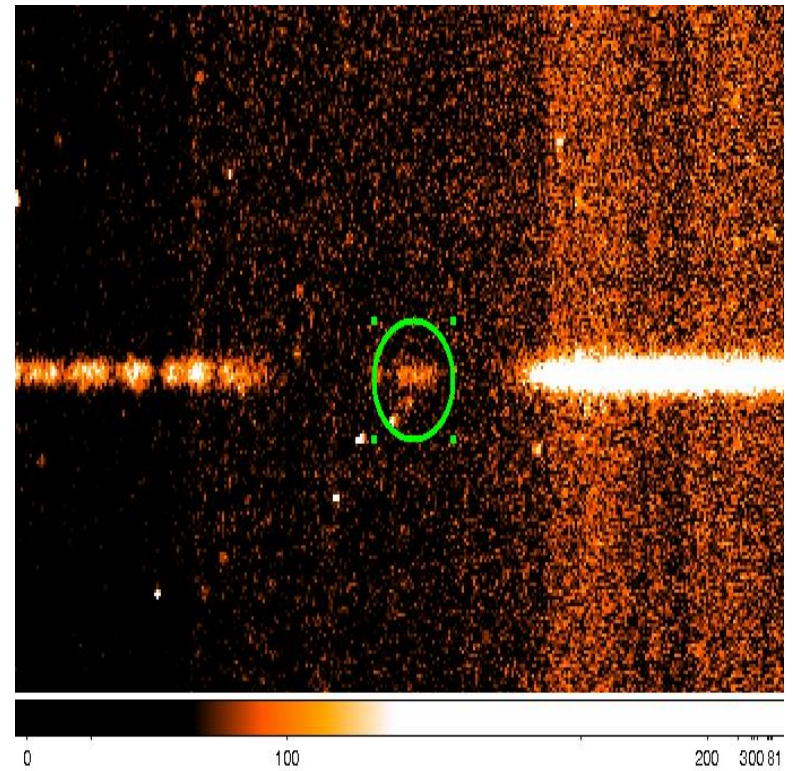
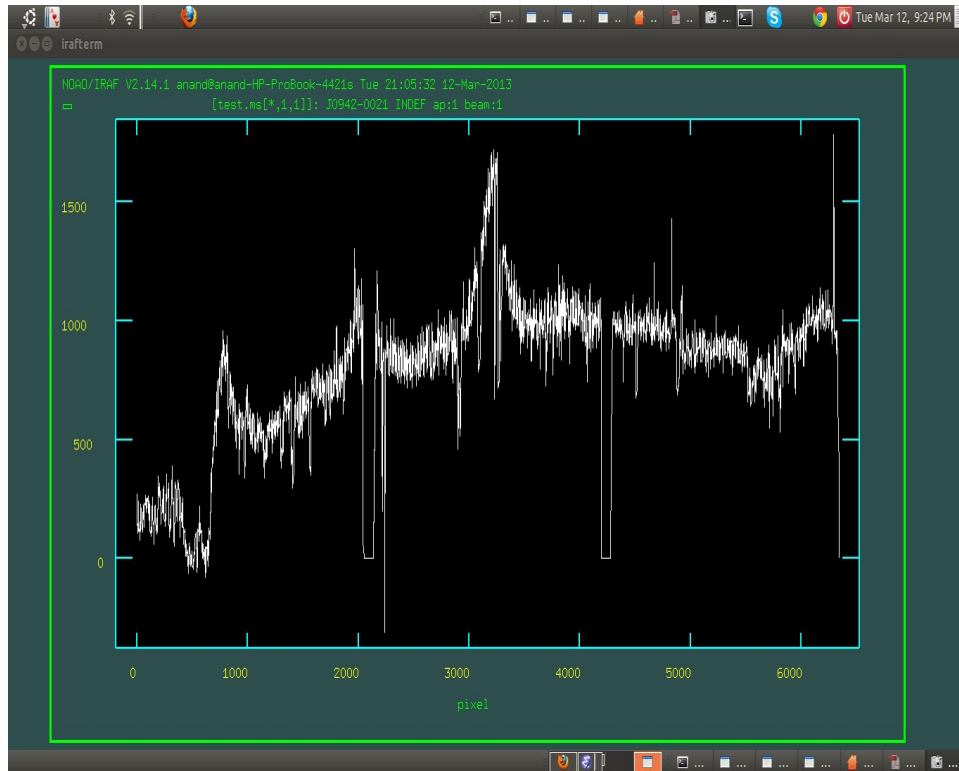
Variability of Low-ionization BAL QSOs

SDSS J0149-0103



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Strong associated Ly- α emitter



Very large radio source hosted by the spiral galaxy

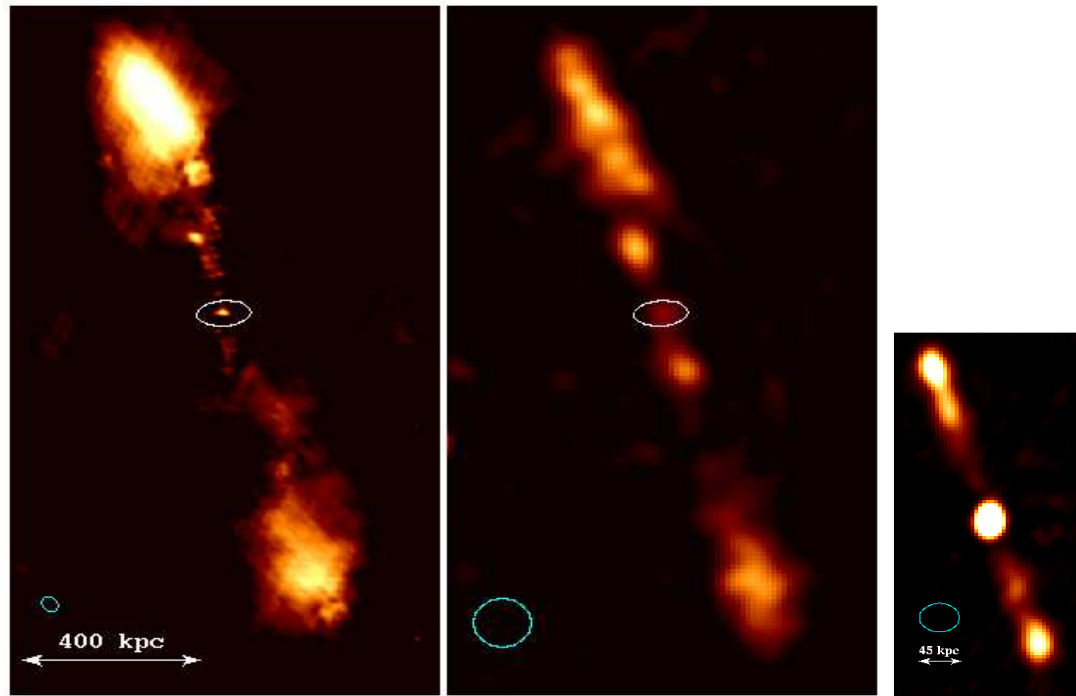
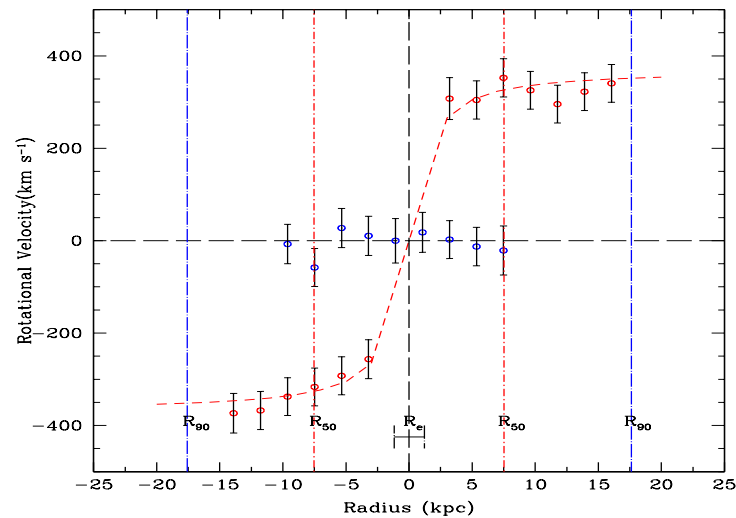
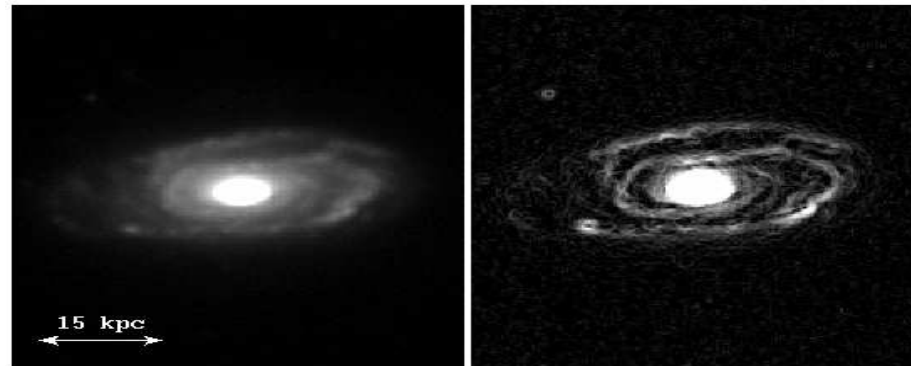


Figure 2 The Radio Images of J2345-0449 . Left panel: GMRT 325 MHz . Center panel: NVSS 1.4 GHz. Right Panel: VLA 4.8 GHz image of inner double.

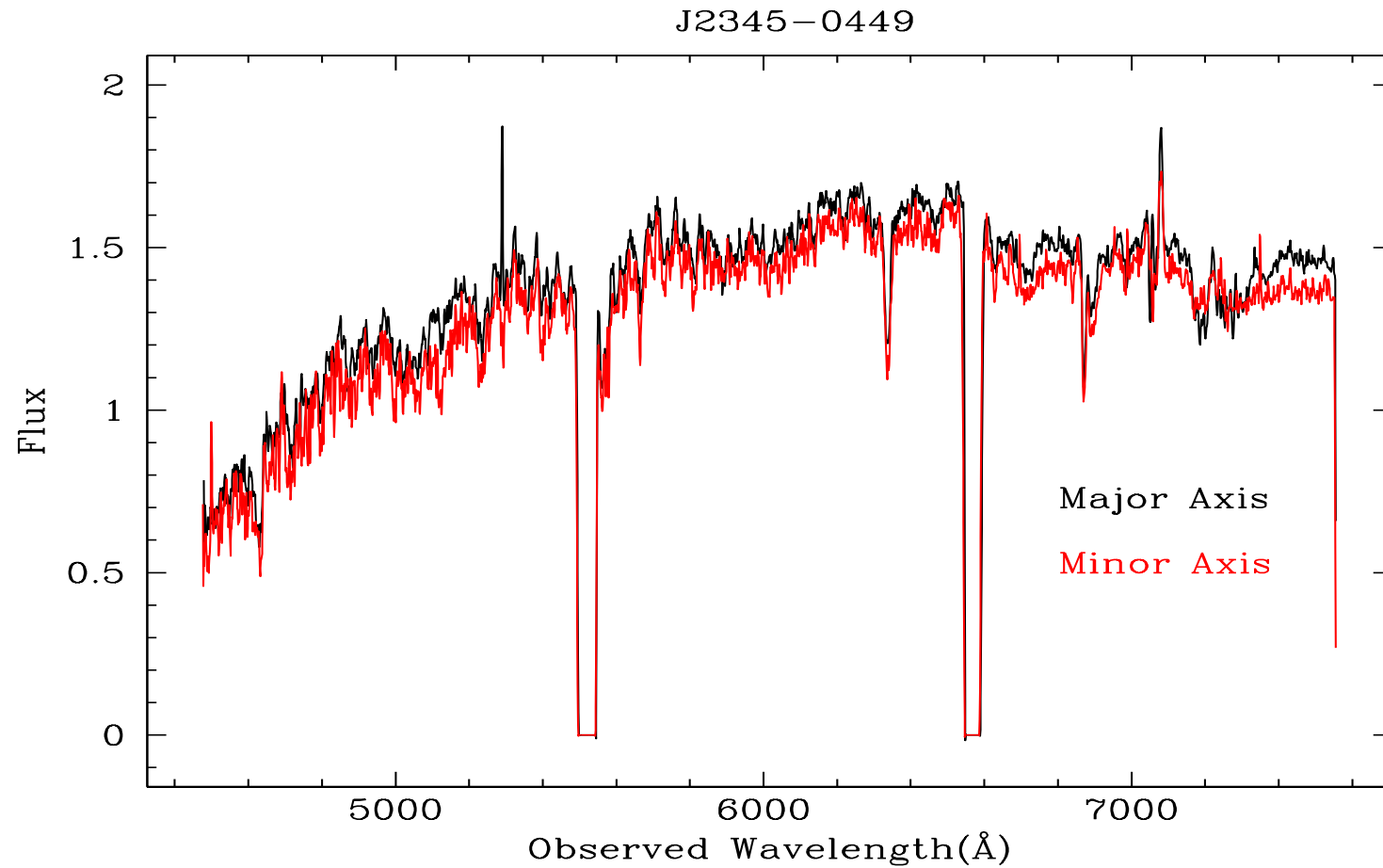
Bagchi et al. in preparation

Very large radio source hosted by the spiral galaxy

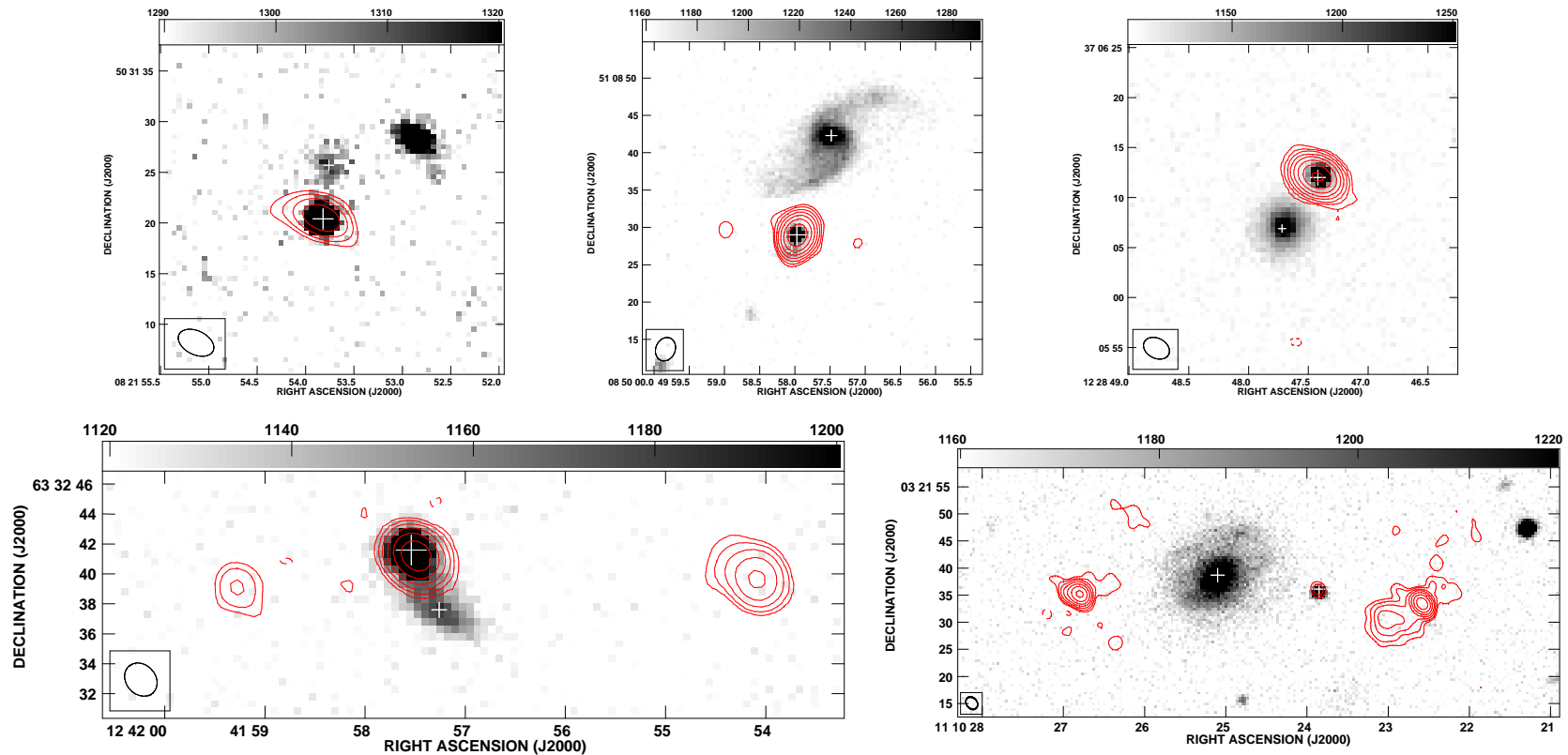


Bagchi et al. in preparation

Very large radio source hosted by the spiral galaxy



QSO-Galaxy Pairs: GMRT/SALT survey



Gupta, et al 2010

Plans for HRS

- Commissioning proposal to observe the brightest southern QSO with $z > 2$ having good quality UVES & HARPS spectra.
- Variation of fundamental constants
- Would like to carryout various IGM related projects with HRS.
- Chemical composition of vary metal poor halo stars.

Summary

- Extra-galactic Astronomy, In particular high redshift galaxies is one of the main observational programmes at IUCAA. At present SALT/RSS is not providing good quality data.
- As far as QSO spectroscopy is concerned, for $r \leq 20$ mag objects we get spectra comparable to that obtained with SDSS. In addition the low free spectral range means lots of observing time to cover reasonable wavelength range with good spectral resolution.
- Better Blue sensitivity will help complementary spectra below 4000Å.
- Inability to detect even strong emission lines (probably due to bigger PSF) is another issue to make progress.
- At present at IUCAA we begin to focus on the repeated observations of bright sources (not that competitive) but publishable.
- We try use SALT for observations of our GMRT sources.