BAL meeting notes

Bologna, 24-26/06/2009

First day

- It seems that there's not a single definition of BAL (BI / AI), it would be nice to come to a common definition to be used in our group.
- During the paper review about BALs it seemed that different opinions are present in literature about Broad Emission Lines in BAL-QSOs: some authors highlight that broader lines than normal are present, others found narrower lines (Trump et al. 2006, *arXiv:astro-ph/0603070*).
- Radio spectral aging uses the method of break frequency in the spectrum of the source to date the considered emission region, but various uncertainties are present. One of them is the magnetic field value. Observing the line split produced in the optical band by Zeeman effect (with resolution greater than usual) could be possible to verify that value.
- It seems that BALs appear like QSOs in optical band, while in radio show a normal galaxy spectrum: accordingly with QSOs objects a flatter spectrum should be present in the synchrotron range.
- A combined study of the dust-gas correlation could be done through HI (radio) and reddening (optical) observations.

Second day

- Is it possible to determine the efficiency of a synchrotron emission region? Maybe by the accretion rate: line broadness gives information about velocity and mass of the accreting matter on black hole. Also Eddington luminosity limit could be useful.
- Variability can be present in different epochs with respect different bands (optical-radio). We can try to find a source variable both in radio and optical in the same period. Time scales would be very different, but start monitoring might be worthwhile.
- Check if there is a relation between source intensity and variation (bright sample more variable than faint?)
- Check if there is a relation between source variability and redshift (variability related to age?)

Third day

- Charlie: interesting features are present also in high resolution spectroscopy. With the Westerbork telescope it's possible to observe CO line, maybe also column density can be achieved (as a cross-check for Florecia value). After obtaining new spectra with new calibrations it will be possible to apply at Westerbork for the October deadline. Possible spin temperature study?
- To define a comparison sample for spectral aging of BALs could be useful.

Publication plan

Radio papers:

- Montenegro et al. (2009): *Spectral ageing analysis of the pilot sample.* Data taken and analysed, contents almost ready (part of FMM's thesis)
- Montenegro et al. (2009): *VLBA results.* Data taken and analysed, contents almost ready (part of FMM's thesis)
- Bruni et al. (2009): *Radio flux densities of the bright sample.* Data partly taken (Effelsberg) or observations scheduled (VLA)
- Salerno et al. (2009): *Variability studies of the pilot sample.* Data partly taken (VLA) or observations scheduled (Effelsberg,VLA)
- Bruni et al. (2010): *Spectral ageing analysis of the bright sample.* Data partly taken (Effelsberg) or observations scheduled (VLA)
- Bruni et al. (2010): *VLBI observations of sources from the bright sample.* Proposals under review

Optical papers:

- Jimènez-Lujàn et al. (2009): *Physical conditions in broad absorption line quasars.* (WHT data reduced and partly analysed)

Overview on proposals

Bruni's PhD thesis (new radio-loud sample - see also slides)

- VLA: observations yet scheduled (July 2009)
- EVN/VLBI: observations approved for EVN, under review for VLBI
- IRAM: observations approved
- GMRT: under review
- JCMT: proposals in the second semester of 2009
- Westerbork: still to be planned

Long-term plans

- Common definition of BAL (AI/BI)
- Statistical aspects of BAL QSOs selection (RC)
- Optical luminosity function of radio quasars with $3.6 < z < 4.5$ (RC)
- Selection of high-z quasars by means of automatic algorithms (RC)