We gather the 12 largest quasar catalogues (4 from radio interferometry programs, 8 from optical survey) and we carry out systematic cross-identifications of the objects to obtain their best position estimates, and to provide physical information at both optical and radio wavelengths. This catalogue compilation designated the LQAC (Large Quasar Astrometric Catalogue), gives equatorial coordinates of 113666 quasars with magnitudes at 9 bandwidths, 5 radio fluxes, redshift and absolute magnitude (when the information is available). We made use of VO tools like Aladin for preliminary studies. For cross identification, data processing and validation, we made use of two different software packages with the same parameters and strategy: VO Topcat with Stilts and homemade Fortran programs.

Scientific and technical objectives for LQAC

The main scientific objective was to build an astrometric and multi-wavelength catalogue gathering all known QSO’s and the Large Quasar Astrometric Catalogue (LQAC). This catalogue was also useful to help for the construction of the optical catalogue referenced same (LQRF) - A. Andrei et al., 2009, to complete optical data for radio sources from the International Celestial Reference Frame (ICRF2 - Gontier et al, 2009) and for the preparation of an input QSO catalogue for GAIA mission. The creation of this catalogue was also interesting for studies like the link between QSO’s radio position and optical positions, the analysis of QSO neighbourhood, their distribution in space and their color magnitude diagrams.

The main technical objective was to compile the largest QSO catalogues following the astrometric precision of each catalogue in decreasing order. For each QSO, its original catalogue was kept and a specific processing was done to detect the right or wrong double identifications. To our compiled set of catalogues we added only QSO from Veron and Veron (2006) catalogue which were not identified. We added also magnitude from large star survey catalogues (2mas, GSC2.3, B1.0) to complete magnitude information whenever it was necessary. To control our procedures we worked with two different softwares (home Fortran programs and virtual observatory tools) and two different teams working on the same original catalogues taken one by one and with the same compilation strategy.

We resolve the wrong double qso (300 pair of QSO’s are in LQAC, their double position is within 2 arc seconds for sources from Hewitt and Burbidge catalogue and Veron and Veron (2006) catalogue which were not identified. We added also magnitude from large star survey catalogues (2mas, GSC2.3, B1.0) to complete magnitude information whenever it was necessary. To control our procedures we worked with two different softwares (home Fortran programs and virtual observatory tools) and two different teams working on the same original catalogues taken one by one and with the same compilation strategy.

LQAC Catalog

The final catalogue LQAC was constructed with the compilation of 12 large QSO catalogues (optical and radio) and includes 113666 quasars, 5 radio fluxes (1.4GHz, 2.3GHz, 5.0GHz, 8.4GHz, 24GHz), 7 photometric magnitude visible (u, b, v, g, r, i, z), 2 infrared magnitude (j, k) and the redshift value. The accuracy of the QSO sources was at the level of the milliarcsecond for sources from ICRF and not worse than 2 arc seconds for sources from Hewitt and Burbidge catalogue and Veron and Veron catalogue. The name of the catalogues and their contents are presented in Tables 1 and 2. After the construction of this catalogue, we have written an article on it in Astronomy and Astrophysics which has been published this year (Souchay, et al. 2009; A&A 494, 799-815).

References


VO Tools used for LQAC Construction

The Virtual Observatory Tools used to construct the LQAC were Aladin freeware from CDS (http://aladin.u-strasbg.fr/aladin) to visualize the catalogues origin. We used VizieR tools from CDS (http://vizier.u-strasbg.fr/viz-bin/VizieR) to get the different catalogues files. At last we used Topcat and Stilts (http://www.starlink.ac.uk/stilts/andhttp://www.star.bris.ac.uk/mvb/topcat) to make cross matching and to construct the LQAC Data Base. The LQAC is now accessible on the CDS web with the reference J/A+A/494/799 in VizieR web service.