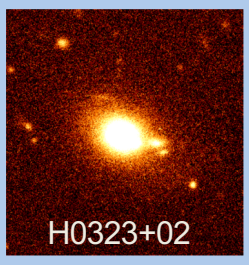
ZBLLAC

A SPECTROSCOPIC LIBRARY OF BL LAC OBJECTS



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http://www.oapd.inaf.it/zbllac/

The knowledge of the distance of the astrophysical objects is of fundamental importance for deriving their intrinsic properties and for any physical models of the sources. In the case of extragalactic targets this is mainly provided by the cosmological redshift. This is usually based either on the absorption features of the stellar population as in the case of galaxies or on their emission lines as is the typical case of quasars. In the case of BL Lac objects the determination of their redshift is particularly arduous. This is because the optical spectrum of these objects is often dominated by a non thermal emission that hides the spectral features of their host galaxy. Moreover at variance with the case of all other kinds nuclei the characteristic emission lines from narrow and/or broad emission line regions are missing or very weak.

The determination of the redshift of these source therefore relies on the quality of the spectroscopic observations and on flux ratio between the nuclear non thermal continuum and the starlight from the host galaxy. In some cases, weak (EW < 1 Å) emission features may be present that help the determination of the redshift. Finally, as in the case of QSO it is possible to find and measure lower limits of the redshift from the detection of intervening absorption features. This is most usable for relatively high redshift targets from optical spectra but also possible for lower redshift objects using UV spectra.

In order to contribute to the knowledge of the spectral properties of this class of sources, we have implemented a spectroscopic library of optical spectra of BL Lac objects. This is available at the URL address: **http://www.oapd.inaf.it/zbllac/**

DESCRIPTION OF THE LIBRARY

The spectroscopic library ZBLLAC contains high quality optical spectra of 243 (June 2018) BL Lac objects collected from various literature sources. The targets are listed in an active table yielding this basic information (see Fig 1) :

✓Name of object with link to NED
✓Coordinates of target (RA, DEC)
✓Redshift or lower limit (when available)
✓V magnitude and adopted instrument
✓Reference to published papers with the spectra

For each target we also provide a figure (PDF format; see Fig. 2) with the flux calibrated optical spectrum of the source and the spectrum normalized to the continuum in order to enhance the weak spectral features. The main spectral lines are also identified with a label.

In addition to the figure a text file of the spectrum is available for download. It gives a simple two columns data with Wavelength (Å) and the Flux (erg cm^{-2} s^{-1} Å^{-1} (see example in Fig. 3). In a number of cases more than one spectrum is available. This is indicated with the symbol ⊕

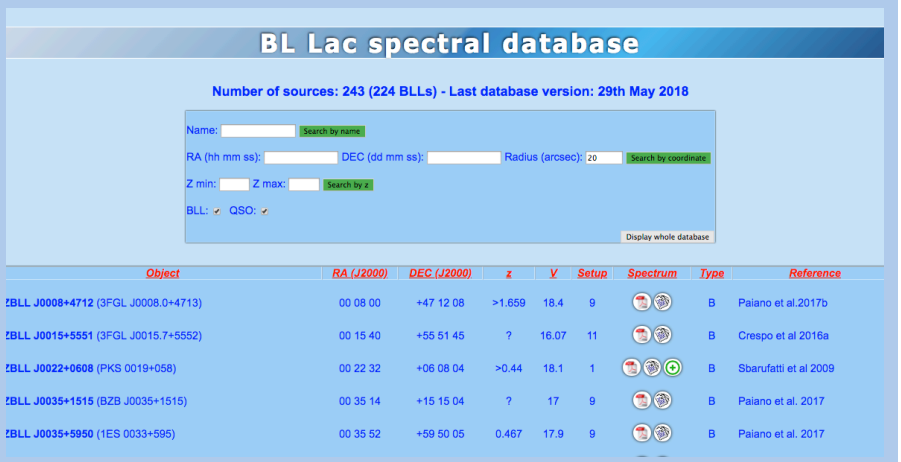
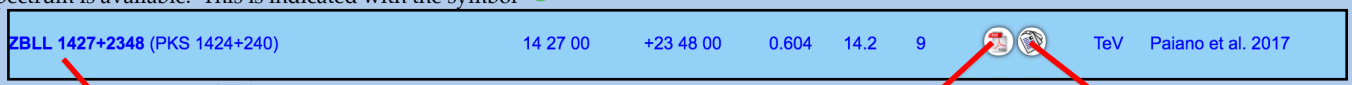
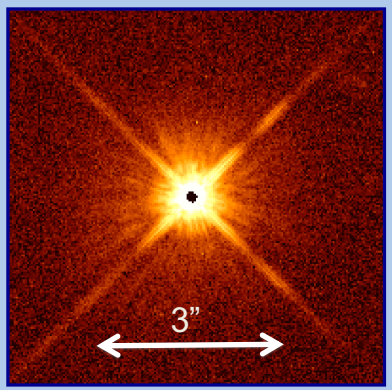


Figure 1 *Example of the list of objects in the spectroscopic library. The database includes the possibility to search objects for name, coordinates and redshift.*





HST (WFPC2 filter F702W) image of the BL Lac object 1424+24

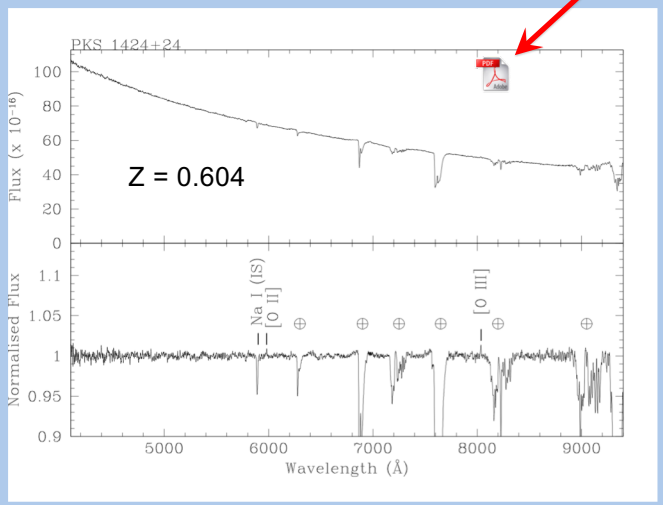


Figure 2 *Example of optical spectrum of the BL Lac object PKS1424+240 (z=0.604). Paiano et al 2017 ApJ 837 144.*

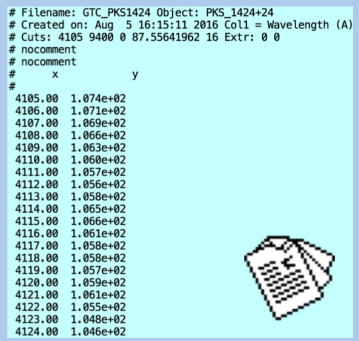


Figure 3 *Example (only few lines) of the text file downloaded from the web site ZBLLAC*