Lockman-SWIRE Spectroscopic Redshift - Selection Functions and Completness - Version 1.0

The Lockman-SWIRE field is covered by only a few surveys each with different selection criteria. We have discussed about the Selection and Completeness Sections for each survey below.

1 Steffen et al. (2004) - Source 1

The study by Steffen et al. (2004) is a photometric and spectroscopic follow-up of X-ray sources in the wide-area, moderately deep *Chandra* Large Area Synoptic X-ray Survey (CLASZS) of the Lockman Hole-Northwest filed. Spectra were obtained with the HYDRA instrument on WIYN and with DEIMOS on Keck. Of the 525 CLASXS sources 467 (90%) were observed with 271 (51%) yielding a spectra, although 20 of these spectra are from stars. The completeness as a function of X-ray flux is shown in Figure 1.

2 Berta et al. (2007) - Source 2

Berta et al. (2007) use the Keck telescope with the LRIS instrument to obtain optical spectroscopy of 35 $z \geq 1.4$ ULIRGs across the Lockman-Hole, ELAIS-N1 and ELAIS-N2 fields. High redshift ULIRGs were targeted by choosing objects which peak at 4.5 or 5.8 μm. In addition a r' magnitude limit of 24.5 (Vega) was imposed to ensure targets were detectable but also objects with $r' < 21$ were avoided. In addition to the primary selection spare slits were chosen to look at interesting photometric sources, such as red optical-NIR colors, X-ray/radio detections etc... The fall sample of Berta et al. (2007) includes 233 objects and in total 139 reliable redshifts were measured. For our catalogue of the Lockman-Hole field we used 44 observations of which we classified 14 as reliable.

3 SDSS DR12 - Source 4

The SDSS data covers the entirety of the Lockman-SWIRE field and provides measurements of 4283 redshifts of which 4274 are considered reliable. As the SDSS contains many different surveys with different selection criteria we refer the reader to the SDSS DR12 web pages. However, the main galaxy sample consists of galaxies with r-band Petrosian magnitudes $r \leq 17.77$ and r-band Petrosian half-light surface brightnesses $\mu_{50} \leq 24.5\,\mathrm{mag\,arcsec^{-2}}$ and are essentially ($\sim 99\%$) complete.

4 Rowan-Robinson Catalogue (2013) - Sources 8 & 16

A study by Smith et al. 2004 of WIYN/Keck/Gemini observations was listed in the Rowan-Robinson catalogue but the original data or paper could not be found. We have assumed the redshifts are reliable but no information on selection or completeness is known. We also use the NED information provided in the same catalogue but any selection information is not known.

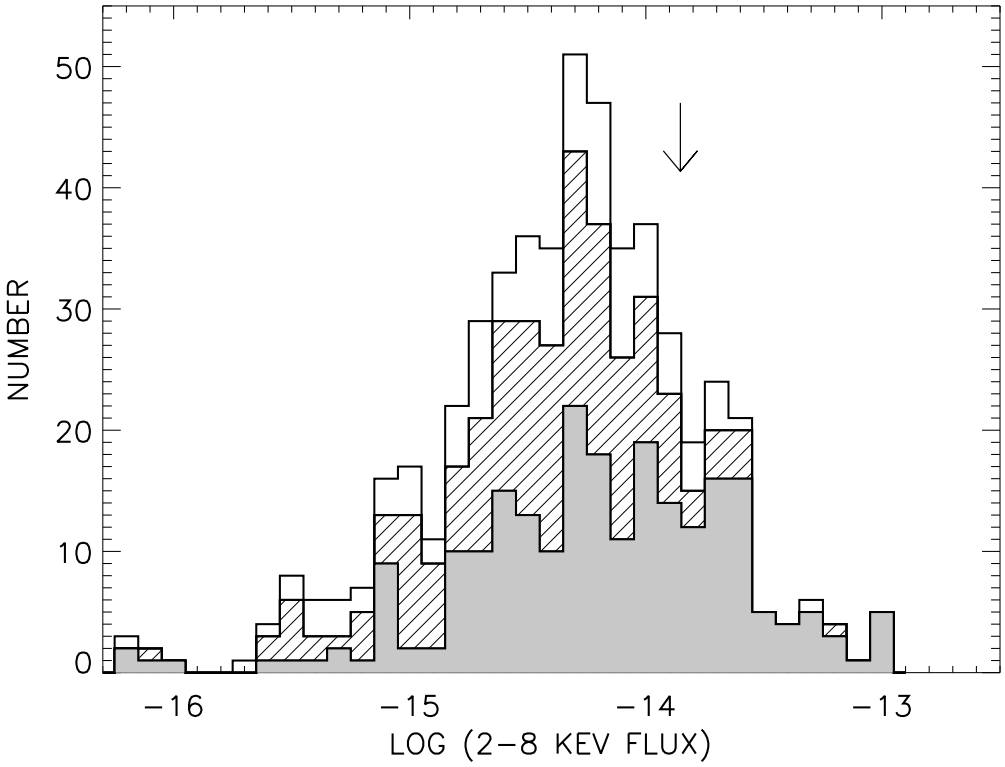

Figure 1 This figure has been taken from Figure 2 in the AGES paper (Kochanek et al. 2012). The caption taken directly from the paper is: The 2–8 keV flux distribution for the 525 CLASXS sources (shaded, spectroscopic redshifts; hatched, spectroscopically observed sources that could not be identified; open, spectroscopically unobserved sources). The arrow marks the flux where the source contribution to the 28 keV XRB peaks.