/A+A/590/A80 2-10keV luminosity function of AGN (Ranalli+, 2016)

The 2-10 keV unabsorbed luminosity function of AGN from the LSS, CDFS, and
COSMOS surveys.

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Abstract:

The XMM-Large scale structure (XMM-LSS), XMM-Cosmological evolution
survey (XMM-COSMOS), and XMM-Chandra deep field south (XMM-CDFS)
surveys are complementary in terms of sky coverage and depth.
Together, they form a clean sample with the least possible variance in
instrument effective areas and point spread function. Therefore this
is one of the best samples available to determine the 2-10keV
luminosity function of active galactic nuclei (AGN) and their
evolution. The samples and the relevant corrections for incompleteness
are described. A total of 2887 AGN is used to build the LF in the
luminosity interval 10^{42}-10^{46}erg/s and in the redshift interval
0.001-4. A new method to correct for absorption by considering the
probability distribution for the column density conditioned on the
hardness ratio is presented.

Description:

The XMM-LSS, XMM-CDFS, and XMM-COSMOS are three surveys with complementary properties in terms of luminosity and redshift coverage.

We used these three surveys to derive Bayesian estimates of the unabsorbed luminosity function (LF) of AGN in the 2-10keV band. The LF estimates are presented as a set of samples from the posterior probability distribution of the LF parameters. The LF is parameterised as a double power-law, with either the luminosity and density evolution (LADE) model, or the luminosity-dependent density evolution (LDDE) model. The double power-law is described by Eq.(10) in the paper. The LADE and LDDE models are described by Eqs. (11-14) and Eqs.(15-17), respectively. A Fortran 2008 implementation of these models can be found in file src2/lumf_funcs.f90 of the LFTools package, in the classes doublepowerlaw, ladevol, and lddevol (see the paper).

File Summary:

FileName	Lrecl	Records	Explanations
ReadMe	80	.	This file
lade-c.dat	166	7565	LF samples from XMM-CDFS, LADE model
lade-k.dat	166	7007	LF samples from XMM-COSMOS, LADE model
lade-l.dat	166	7050	LF samples from XMM-LSS, LADE model
lade-lck.dat	166	7066	LF samples from all surveys together, LADE model
ldde-c.dat	166	7622	LF samples from XMM-CDFS, LDDE model
ldde-k.dat	166	8450	LF samples from XMM-COSMOS, LDDE model
ldde-l.dat	166	7749	LF samples from XMM-LSS, LDDE model
ldde-lck.dat	166	7403	LF samples from all surveys together, LDDE model

Byte-by-byte Description of file: lade-*.dat ldde-*.dat

Bytes	Format	Units	Label	Explanations
1- 21	E21.18	---	norm	Normalisation (1)
23- 43	E21.18	---	gamma1	Exponent of the first branch of the power-law
45- 65	E21.18	---	gamma2	Exponent of the second branch of the power-law
67- 82	F16.13	[10-7W]	Lstar	Knee luminosity of the LF
84-100	F17.15	---	zc	Critical redshift
102-122	F21.18	---	p1	First luminosity evolution slope
124-144	E21.18	---	p2	Second luminosity evolution slope
146-166	E21.18	---	d	Density evolution slope

Note (1): The values in the table are defined as:
norm=6+log10(A) where A is
the normalisation defined in Eq.(10) of the paper.

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