

Fermi detected blazars seen by INTEGRAL

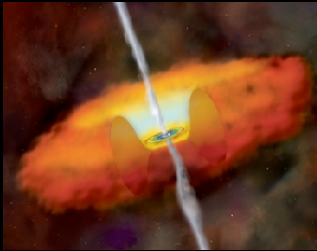
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Abstract: INTEGRAL provides hard X-ray spectra for 11 of the blazars included in the Fermi/LAT bright source list

INTEGRAL and Fermi blazars

Out of the 18 blazars detected by INTEGRAL above 20 keV, 11 are also included in the Fermi bright source sample. INTEGRAL provides simultaneous V-band (OMC), X-ray (3-20 keV, JEM-X) and hard X-ray data (IBIS/ISGRI, 20-500 keV). INTEGRAL allows long (3 days) uninterrupted observations providing the best sensitivity in the 20 - 500 keV band today.



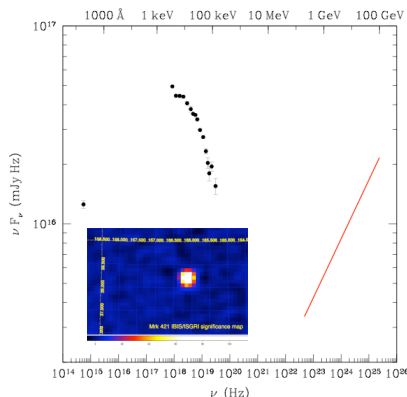
INTEGRAL IBIS/ISGRI average spectra

Name	$\Gamma_{20-200\text{keV}}$	$\log L_{20-100\text{keV}}$
1ES 0033+595	$3.6^{+0.4}_{-0.3}$	44.36
PKS 0528+134		47.51
QSO B0716+714		45.24
Mrk 421	$2.45^{+0.03}_{-0.02}$	44.92
3C 273	1.92 ± 0.03	46.09
3C 279	1.6 ± 0.2	46.40
Mrk 501	2.8 ± 0.3	44.05
PKS 1830-211	$1.49^{+0.05}_{-0.07}$	48.19
1ES 1959+650	1.9 ± 0.4	44.32
BL Lac	$1.8^{+0.4}_{-0.3}$	44.34
3C 454.3	1.58 ± 0.06	47.76

Fermi blazars in the 2nd INTEGRAL AGN catalog

We used the public data of the INTEGRAL mission in order to build the second INTEGRAL spectroscopic AGN catalog. While the first catalog (Beckmann et al 2006) included 38 objects, we now studied ISGRI, JEM-X, and OMC data of 199 AGN. Among those, 11 blazars plus NGC 1275 and Cen A are commonly detected by Fermi and INTEGRAL IBIS/ISGRI.

The average luminosity of this blazar sample is $L_{20-100\text{keV}} = 10^{46}$ erg/sec with a photon index of 1.59 ± 0.06 , indicating that the objects are seen by INTEGRAL mainly in outburst. The average mass of the central engine in blazars ($\langle \log M_{\text{BH}} \rangle = 9.5$) is significantly higher than in the Seyfert class ($\langle \log M_{\text{BH}} \rangle = 7.6$). Masses in solar units.

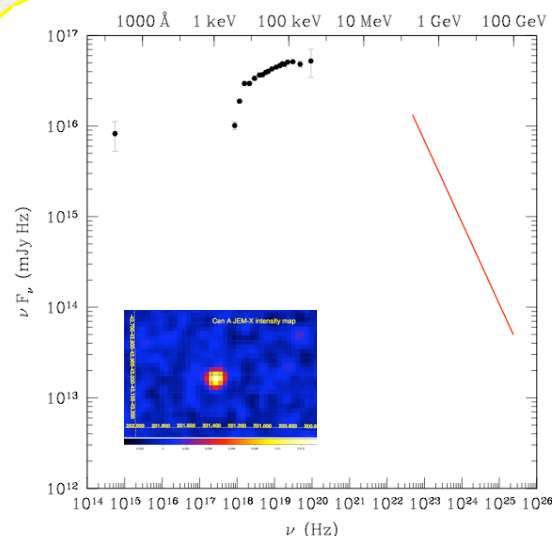


Combined INTEGRAL OMC, JEM-X and IBIS/ISGRI data of Mrk 421 with the Fermi average measurement. Note that data are not simultaneous (INTEGRAL data dominated by outburst)

Added value

INTEGRAL can provide significant spectral coverage in order to reconstruct the SED of Fermi detected blazars. This can be achieved by target of opportunity (ToO) observations when the Fermi data indicate an outburst of a blazar. INTEGRAL is an open observatory, i.e. you can write a ToO proposal for the next announcement of opportunity (dead line for proposals will be April 23, 2010 for observations starting January 2011).

Background image: INTEGRAL IBIS/ISGRI 20-40 keV significance map



Combined INTEGRAL and Fermi data of Cen A. Although not simultaneous, Cen A is only mildly variable and thus these data give a good estimate of the true SED.



The APC is an Institute in Paris (France) devoted to particle astrophysics and cosmology. Learn more at <http://www.apc.univ-paris7.fr>

Find out more in the 2nd INTEGRAL AGN Catalog:
arXiv:0907.0654 (Beckmann et al. 2009, A&A, 505, 417)