

CROSS-CALIBRATION $E > 10$ KEV

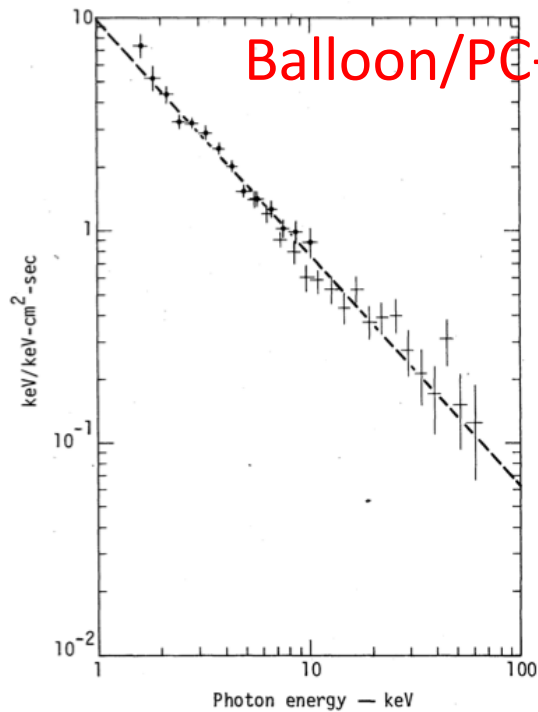
- Is the Crab still a reference source?
- Increasing signal-to-noise: are source models appropriate?
- How to extend the cross-calibration using simultaneous observations?
- How to best coordinate these observations?
- Can we explore common methodologies?
- Link to the soft X-ray band

ABSOLUTE FLUX MEASUREMENTS

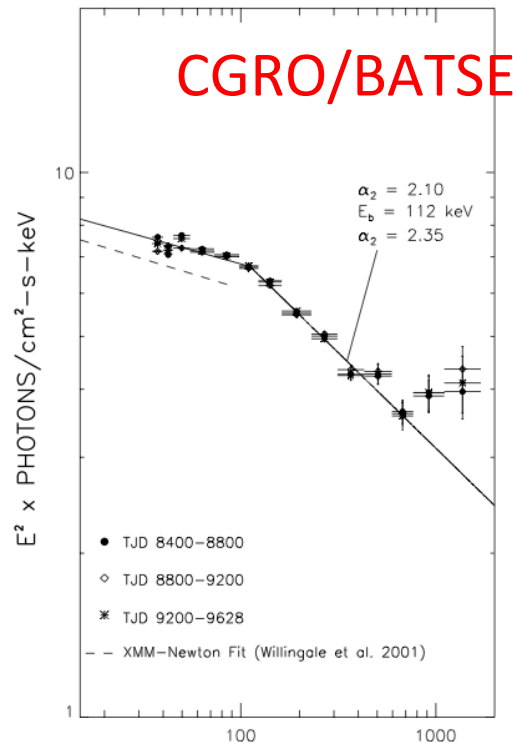
Hard band

Many balloon borne observations

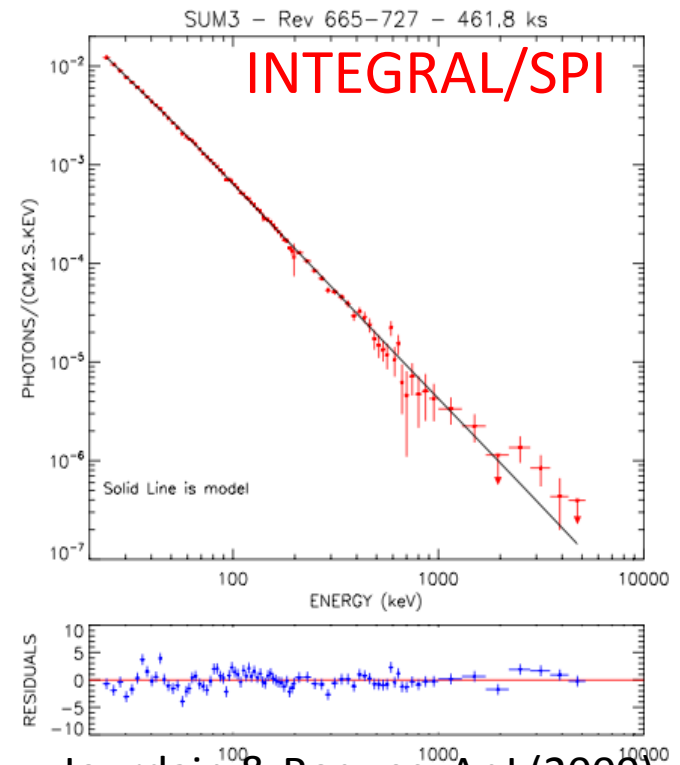
- ❑ BATSE, COMPTEL & SPI: PL with break at ~ 100 keV
- ❑ A high energy component (> 700 keV) is seen by BATSE, not seen by SPI



Toor & Seward, AJ (1974)



Ling & Wheaton (2003)

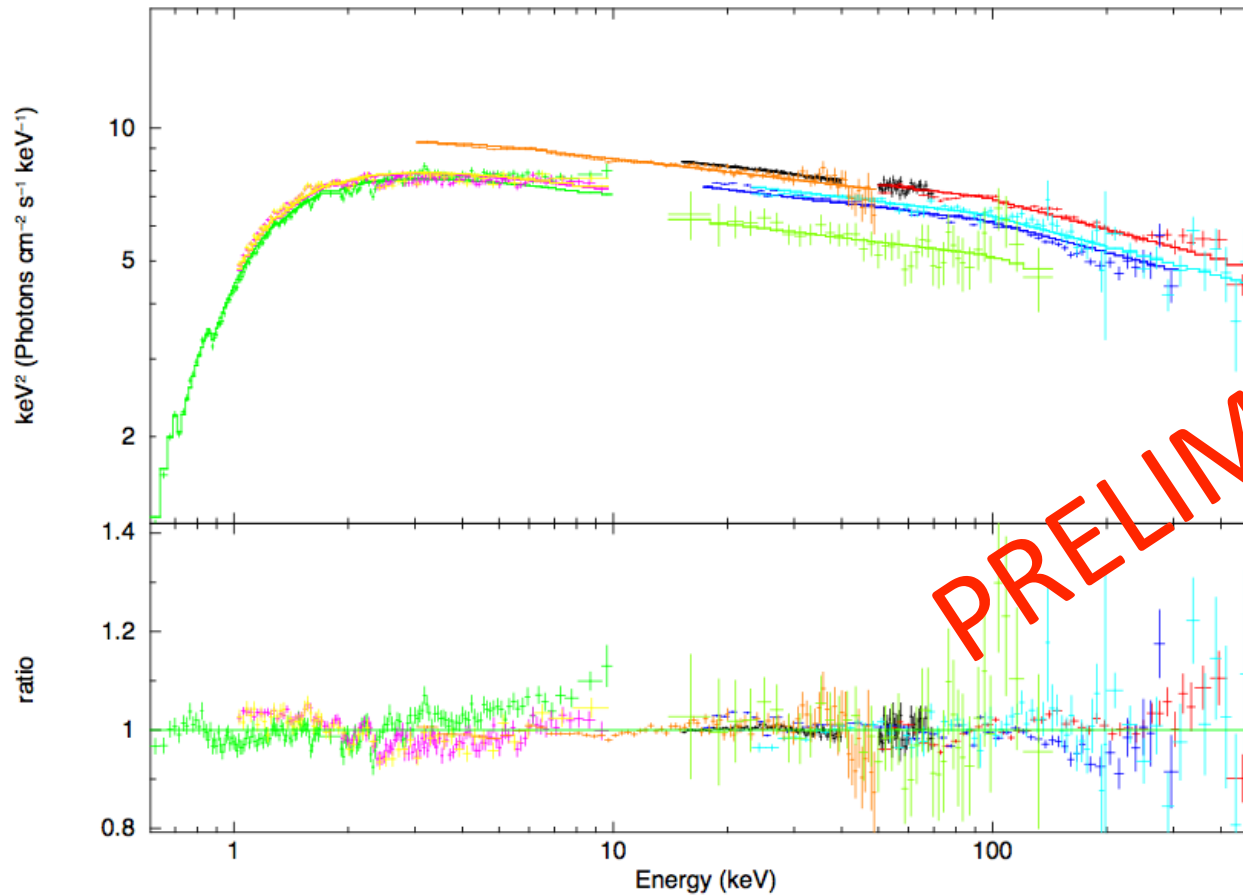


Jourdain & Roques, ApJ (2009)

CRAB CROSS-CALIBRATION

- ❑ the high energy source in the Crab can still be considered a reference source, despite the most recent detections of variability and flaring
- ❑ The broad band spectrum is consistent with a spectral break at $E \sim 100$ keV
- ❑ The Crab cross-calibration project will update the cross-calibration with the most recent observations. Potentially very useful information for upcoming missions
- ❑ The preliminary results show that the major differences when comparing spectra of different instruments are in the effective area normalizations
- ❑ Periodic monitoring (\sim few months timescale) of the source and possibly dedicated, co-ordinated campaigns will be useful

AVERAGE SPECTRUM



Parameter	HXD/PIN	HXD/GSO	XIS1	IBIS	SPI	EPIC-pn1	EPIC-pn 2	PCA	BAT
C_f	1.093 ± 0.005	1.092 ± 0.006	0.879 ± 0.007	0.969 ± 0.005	1.0	0.904 ± 0.007	0.909 ± 0.07	1.063 ± 0.006	0.809 ± 0.015
Fl_{2-10}			19.24 ± 0.03			19.79 ± 0.02	19.88 ± 0.06	23.265 ± 0.012	
Fl_{20-100}	19.03 ± 0.09	19.45 ± 0.15		17.26 ± 0.05	17.66 ± 0.04			16.49 ± 0.05	14.41 ± 0.21

PCA: Fl_{20-100} is upper bound t 80 keV