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Combining JEM-X and ISGRI data

Suggestions for a cookbook

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The XMMU J174716.1-281048* / IGR J17464-2811 case

1. ATel #970: IGR J17467-2811 type I X-ray burst discovered by JEM-X
2. Del Santo et al., 2007 (astro-ph/0704.2134): PRE $\Rightarrow$ **d $\approx$ 3 kpc** **
3. ATel #1207: Refined distance: **d $\approx$ 8 kpc**

* ATel #972
** Cited by ATels #1078, 1136, 1174

Model: **constant<1>*wabs<2>(bbodyrad<3>)**

Model par	Fit par	Model comp	Component	Parameter	Unit	Value			Data group
1	1	1	constant	factor		**1.00000**	frozen		1
2	2	2	wabs	nH	10^22	6.75260	+/-	0.00000	1
3	3	3	bbodyrad	kT	keV	1.85120	+/-	0.00000	1
4	4	3	bbodyrad	norm		1345.90	+/-	0.00000	1
5	5	4	constant	factor		**0.140130**	+/-	0.00000	2
6	2	5	wabs	nH	10^22	6.75260	= par	2	2
7	3	6	bbodyrad	kT	keV	1.85120	= par	3	2
8	4	6	bbodyrad	norm		1345.90	= par	4	2

Chi-Squared = 81.78282 using 81 PHA bins.
Reduced chi-squared = 1.062115 for 77 degrees of freedom
Null hypothesis probability = 0.333

```
  ------------------------------------------------------------------------------
  Model:  constant<1>*wabs<2>( bbodyrad<3> )
  Model Fit Model Component  Parameter  Unit     Value
Data
  par   par comp
group
    1     1    1   constant   factor             1.00000     frozen            1
    2     2    2   wabs       nH       10^22     0.00000     frozen            1
    3     3    3   bbodyrad   kT       keV       1.85120     +/-   0.00000     1
    4     4    3   bbodyrad   norm               1345.90     +/-   0.00000     1
    5     5    4   constant   factor            0.140130     +/-   0.00000     2
    6     2    5   wabs       nH       10^22     0.00000     = par   2         2
    7     3    6   bbodyrad   kT       keV       1.85120     = par   3         2
    8     4    6   bbodyrad   norm               1345.90     = par   4         2
  ------------------------------------------------------------------------------
  ------------------------------------------------------------------------------
    3 variable fit parameters
 Chi-Squared =      898.4246     using     81 PHA bins.
 Reduced chi-squared =      11.51826     for     78 degrees of freedom
 Null hypothesis probability =  0.00
XSPEC>fl 1. 30.
 Model flux   20.16     photons ( 1.6902E-07 ergs)cm**-2 s**-1 (  1.000- 30.000)
DtSet :  1
 Model flux   2.825     photons ( 2.3684E-08 ergs)cm**-2 s**-1 (  1.000- 30.000)
DtSet :  2
```

⇒ Bad flux (~10x) ⇒ bad distance…

The cross correlation factor must not be let free on too poor statistical data (short time interval)*.

* TBC with OSA 7

The cross correlation factor obtained from long Crab observation is: JEMX / ISGRI ≈**0.8**
or: ISGRI / JEMX ≈**1.3**

Cookbook

- Freeze the normalisation constant to 1 for one of the instruments.
- Limit the cross correlation factor inside 0.8 and 1.3, respectively.
- Apply 3% systematics to JEM-X and 2% to ISGRI.
- The interval times must be identical $\Rightarrow$
- Use only data for which the source is inside both instrument FoVs.

- Source distance estimate must be done (assuming a PRE) from the XrB peak flux, not the average spectrum flux.