We fit a 2-T APEC model to just the 6.0 to 8.0 Angstrom interval in the MEG data and then, separately, to the same wavelength interval in the HEG data. In both cases, we fit the -1 and +1 orders combined (but not coadded).

We freeze the 2-Ts at 1.5 and 5.5 keV respectively, and the abundances at 0.5 solar. These values are from earlier, global fitting. We freeze N_H = 1.2e22. So, only the normalizations of the two temperature components are free. The fits aren't too bad.

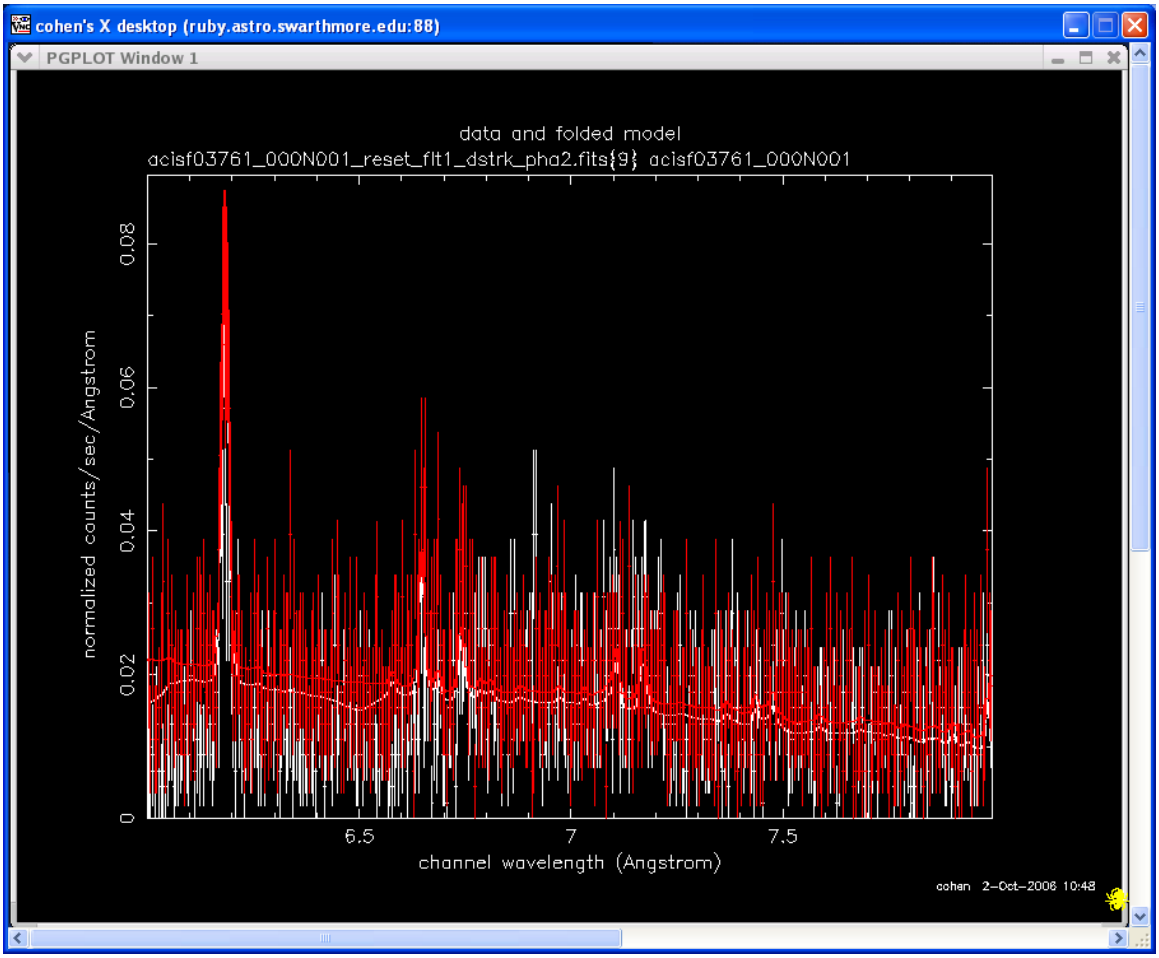
What we're looking for is a systematic difference in the normalizations.

First, the **MEG** data:

```
 ------------------------------------------------------------------------
 Model:  wabs<1>( apec<2> + apec<3> )
 Model Fit Model Component  Parameter  Unit     Value
 par   par comp
   1   1   1  wabs       nH       10^22      1.20000     frozen
   2   2   2  apec       kT       keV        1.50000     frozen
   3   3   2  apec       Abundanc            0.500000    frozen
   4   4   2  apec       Redshift            0.00000     frozen
   5   5   2  apec       norm               1.404103E-02 +/-  0.187497E-02
   6   6   3  apec       kT       keV        5.50000     frozen
   7   3   3  apec       Abundanc            0.500000    = par   3
   8   7   3  apec       Redshift            0.00000     frozen
   9   8   3  apec       norm               4.568344E-02 +/-  0.165352E-02
 ------------------------------------------------------------------------
 ------------------------------------------------------------------------
 C-statistic =      961.4338     using   798 PHA bins.
 Akaike Information Criterion =      4008.076
 Bayesian Information Criterion =      4021.552
XSPEC>goodness nosim 100
100.00% of realizations have a fit statistic <      961.4
```

OK, save this as MEG_APEC_2T_fixedabund.dat

Here's the xspec plot:



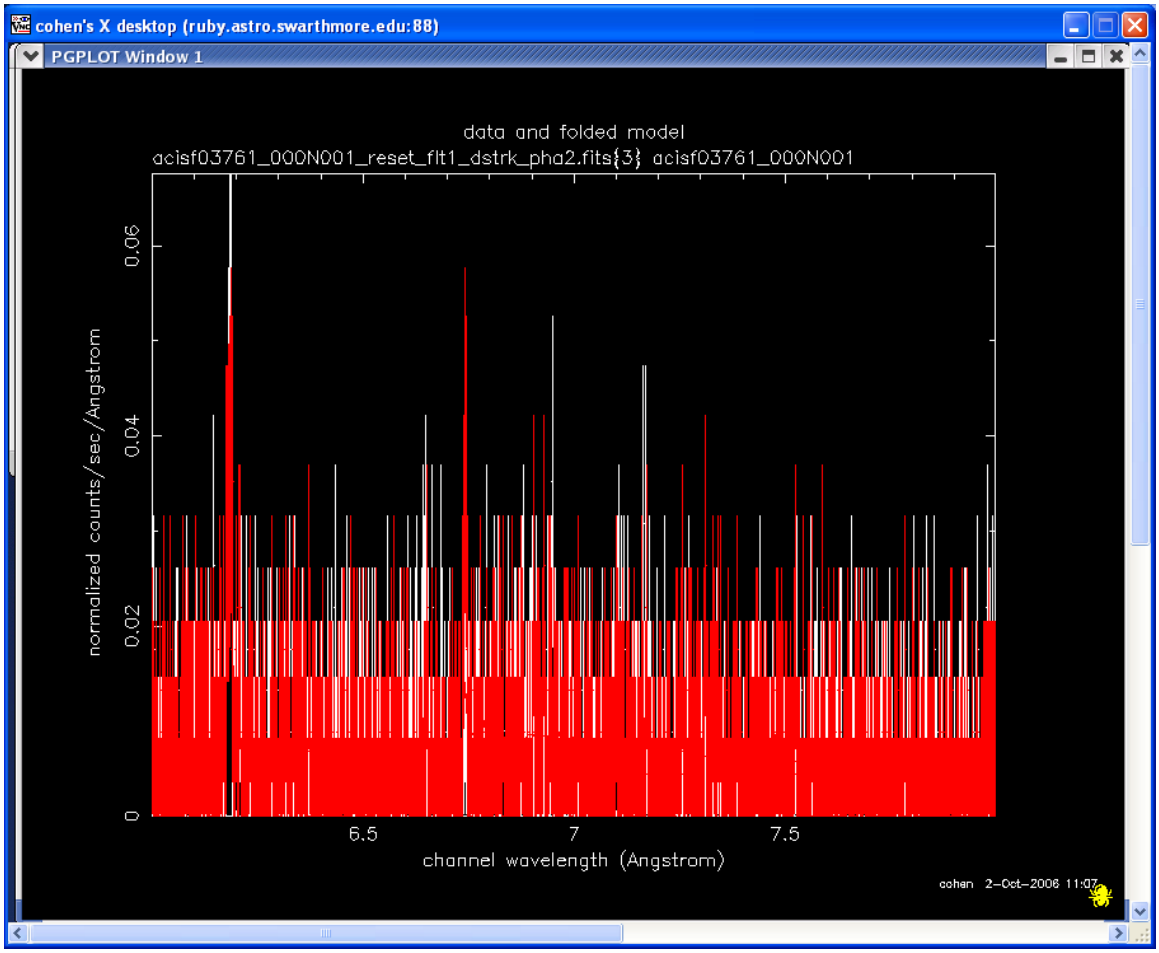
Now, for **HEG** (same 2-T with fixed Ts and abunds):

Model: wabs<1>(apec<2> + apec<3>)

Model Fit Model Component				Parameter	Unit	Value	
par	par	comp					
1	1	1	wabs	nH	10^22	1.20000	frozen
2	2	2	apec	kT	keV	1.50000	frozen
3	3	2	apec	Abundanc		0.500000	frozen
4	4	2	apec	Redshift		0.00000	frozen
5	5	2	apec	norm		**5.339255E-03** +/- 0.114215E-02	
6	6	3	apec	kT	keV	5.50000	frozen
7	7	3	apec	Abundanc		0.500000	frozen
8	8	3	apec	Redshift		0.00000	frozen
9	9	3	apec	norm		**1.554730E-02** +/- 0.779909E-03	

C-statistic = 1746.626 using 1598 PHA bins.
Akaike Information Criterion = 4827.491

Bayesian Information Criterion = 4839.124
XSPEC>plot
XSPEC>goodness nosim 100
3.00% of realizations have a fit statistic < 1747.



*The normalizations of the two components in the HEG fit are **2 to 3 times lower** than the normalizations for the MEG fit.

Here are plots of the coadded MEG and then HEG data on the same interval, with the fixed 2-T models:

http://astro.swarthmore.edu/~cohen/projects/doar21/heg_apec_2t_fixedabund.jpg
http://astro.swarthmore.edu/~cohen/projects/doar21/meg_apec_2t_fixedabund.jpg

(.ps files are there too).

--- NOTE --- I noticed the following when loading in the data, rmfs, and garfs. Marc made these garfs a year ago. Is it possible that the garfs were made with the wrong rmfs specified?

XSPEC>@loaddata_meg

!XSPEC> data 1 acisf03761_000N001_reset_flt1_dstrk_pha2.fits{9};
Net count rate (cts/s) for file 1 8.1031E-02+/- 2.2107E-03
1 data set is in use

!XSPEC> data 2 acisf03761_000N001_reset_flt1_dstrk_pha2.fits{10};
Net count rate (cts/s) for file 2 9.1494E-02+/- 2.2459E-03
2 data sets are in use

!XSPEC> resp 1 meg_m1.rmf;

!XSPEC> tclunknown resp 1 meg_m1.rmf

!XSPEC> ::namespace current

!XSPEC> response 1 meg_m1.rmf

!XSPEC> resp 2 meg_p1.rmf;

!XSPEC> tclunknown resp 2 meg_p1.rmf

!XSPEC> ::namespace current

!XSPEC> response 2 meg_p1.rmf

!XSPEC> arf 1 acisf03761MEG_-1_garf.fits;
Note that RESPFILE keyword in ARF is grid(heg_p1_rmf.fits[cols ENERG_LO,ENERG_HI])
Note that RESPFILE keyword in ARF is grid(heg_p1_rmf.fits[cols ENERG_LO,ENERG_HI])

!XSPEC> arf 2 acisf03761MEG_1_garf.fits;
Note that RESPFILE keyword in ARF is grid(heg_p1_rmf.fits[cols ENERG_LO,ENERG_HI])
Note that RESPFILE keyword in ARF is grid(heg_p1_rmf.fits[cols ENERG_LO,ENERG_HI])

IS THERE A PROBLEM WITH HOW THE GRATING ARFS WERE CREATED?
Here are the two MEG garfs, and they have heg_p1* as the respfile keyword…