XSPEC info

Here is some help for spectral analysis with XSPEC.

START XSPEC
In unix prompt, type “xspec”

READ IN THE DATA
XSPEC> data pn_gt10_0006_min100.pha

SHOW ALL INFORMATION
XSPEC>show

EXCLUDE CHANNELS E<0.5 KEV AND E>7 KEV
XSPEC> ignore 0.0-0.5 7.-**

PLOT DEFINITION
XSPEC>cpd /xwin
XSPEC>setplot energy
XSPEC>plot ldata

HELP FOR THE MODELS
XSPEC> help model wabs
XSPEC> help model mekal

wabs models the Galactic absorption. It is controlled by the hydrogen column density parameter. You will find the value using a tool
http://heasarc.gsfc.nasa.gov/cgi-bin/Tools/w3nh/w3nh.pl

mekal is a model for the cluster gas emission. You need to find out the redshift of your cluster e.g. from NED catalogue: http://nedwww.ipac.caltech.edu/

CHOOSE A MODEL
XSPEC> model wabs*mekal

CHANGE PARAMETER VALUE
XSPEC> newpar 3 2.0

FIX PARAMETER TO CURRENT VALUE
XSPEC> freeze 1

ALLOW A PARAMETER TO VARY
XSPEC> thaw 4

"NH", "redshift" and "switch" parameters should be fixed.
"kT", "Abundanc" and "norm" should be free parameters

FIT THE DATA
XSPEC>fit

SAVE THE BEST-FIT INTO A FILE
XSPEC>save all name.xcm

BEST-FIT PARAMETERS
Reported on the screen

$$norm = \frac{10^{-14}}{4\pi[D_A(1+z)]^2}\int n_e n_i dV\,[cm^{-5}]$$

where D_A is the angular diameter distance to the source in cm, (defined by the redshift and cosmology)

STATISTICAL UNCERTAINTY
XSPEC> error 1.0 7

PLOT THE DATA AND THE BEST FIT MODEL
XSPEC>plot ldata ratio

MODIFY PLOT RANGE:
XSPEC>setplot command rescale x 0.1 10.
XSPEC>setplot command rescale y 1e-9 0.03

MAKE A PS-FILE (DEFAULT NAME PGPLOT.PS)
XSPEC> cpd /cps
XSPEC>plot
XSPEC>cpd /xwin
XSPEC>plot

PLOT THE MODEL
XSPEC>plot model