



**University of
Leicester**

Space Research Centre

XMM EPIC Cal-Ops Meeting

7 June 2001

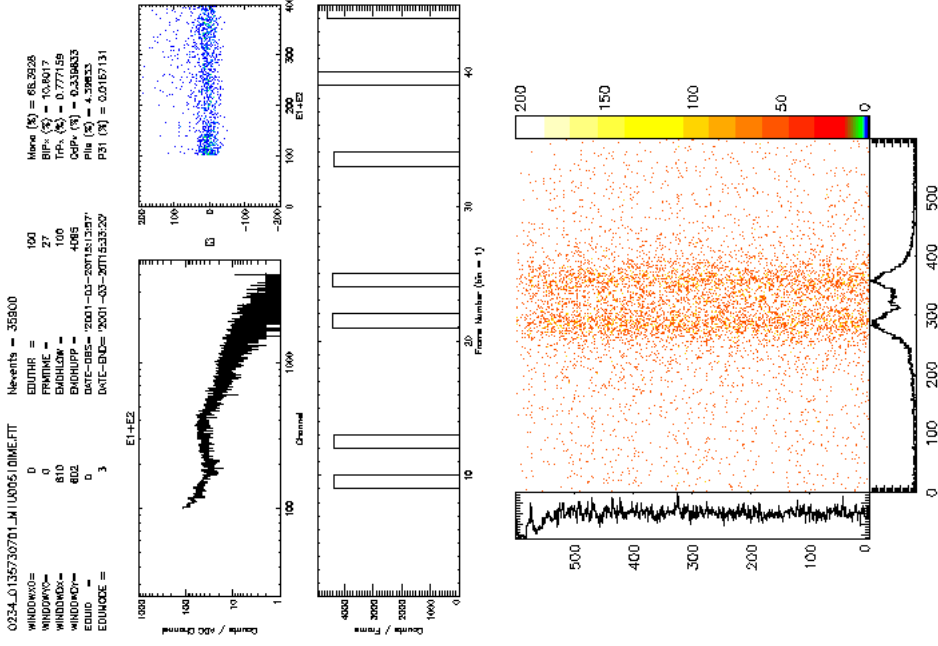
New MOS modes

Tony Abbey - Leicester University

Wide Timing Mode

- Was always “hovering in the background” - didn’t quite make into the approved list
- Readout in “chart recorder” mode with 2 rows binned to improve time resolution - approx 6ms
- Uses free run with normal imaging mode patterns, therefore better noise rejection possible
- Hides as normal image mode, so no extra mode database upgrades required
- Can be loaded into all CCDs for a survey of pulsars
- Tested at Panter with JET-X mirror, summer 2000
- Tested on XMM on Crab during rev 234 - 20 March 2001
- Results on next page show Crab was much too bright, so we needed to narrow both the energy and area ROIs to get out of FIFO overflow, but still lots of counting mode.
- Present analysis has not identified the pulsar

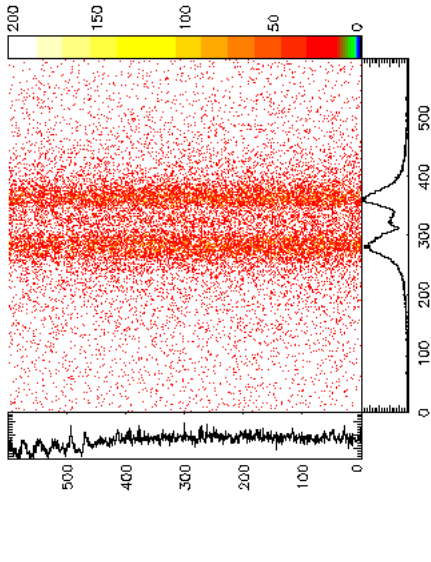
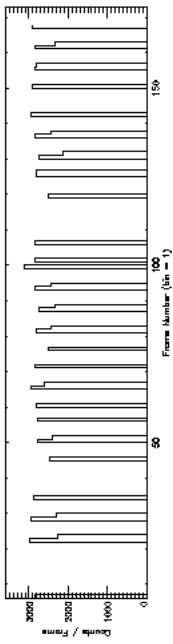
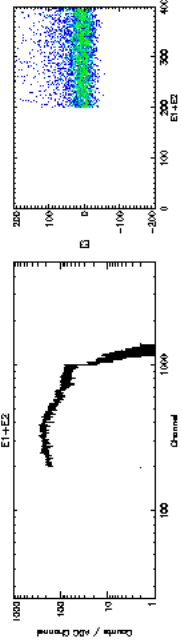
Crab - rev 234 - wide timing mode



CCD1 EDU threshold 100

Crab - rev 234 - wide timing mode

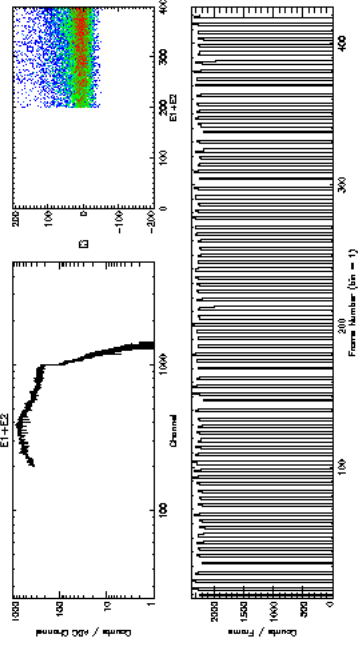
```
0234_0135730701_M1U006 (DMEFT)  Events = 106657
WINDOW= 0  EDITR = 100
WINDOWC= 0  EDITC = 200
WINDOWD= 810  EDITD = 200
WINDOWE= 602  EDITE = 1000
EDUO = 0  DATE=06=2001-03-20T15:28:42
EDUODE = 3  DATE=ENC=2001-03-20T18:11:32
      Mean (X) = 76.8570
      Sig (Y) = 0.158458
      CDR (X) = 0.258886
      Phi (X) = 3.82793
      PSI (Y) = 0.00000
```



CCD1 EDU threshold 200
HBR threshold 1000

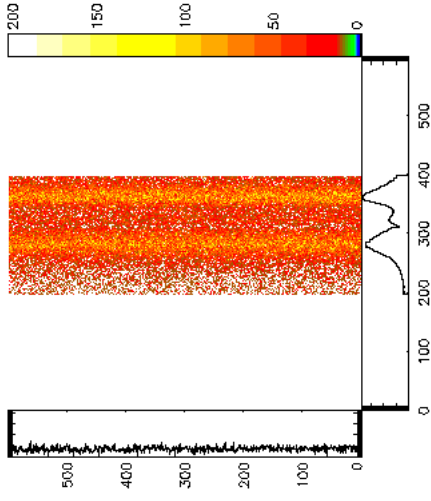
Crab - rev 234 - wide timing mode

```
0234_0135730701_M1100081.DIMFIT  Events = 3462819
WINDOW= 0  EDITOR = 100
WINDOWC= 810  ENHANC = 200
WINDOWD= 600  ENHANCE = 1000
EDUO = 0  DATE=085 = 2001-03-20T16:27:17
EDUOODE = 3  DATE=ENC= 2001-03-20T17:07:00
```



CCD1 EDU threshold 200
HBR threshold 1000

Remove left and right borders
by setting high EDU offset



Future possibilities

- For wide timing mode need to decide whether the binning of more rows would improve the time resolution
- Ed Serpell has proposed a fast wide timing mode:
 - Same operational mode as normal timing
 - Sequence code increments column start offset by 100 so 6 consecutive frames will scan a 100 column band across the CCD.
- Possible difficulty of keeping in sync with the sequence, since there is currently no flag value for the 6 sequences.