Technical University of Denmark

JEM-X Status, April 2009

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Gain evolution

- JEM-X1 DV setting was lowered in orbit 533 to DV=73, to DV=72 in orbit 623, and to DV=71 in orbit 747
- Next lowering is expected towards end of 2009 (if JEM-X1 is still the unit used)
- Gain dependence on detector temperature has increased from 1% per degree to almost 4% per degree
- This increased temperature dependence may force earlier lowering of DV, to avoid very high gain when temperature is high

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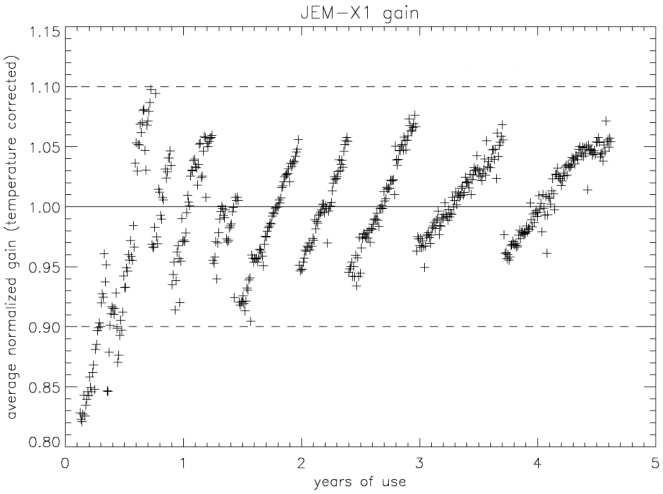
Gain evolution to orbit 735



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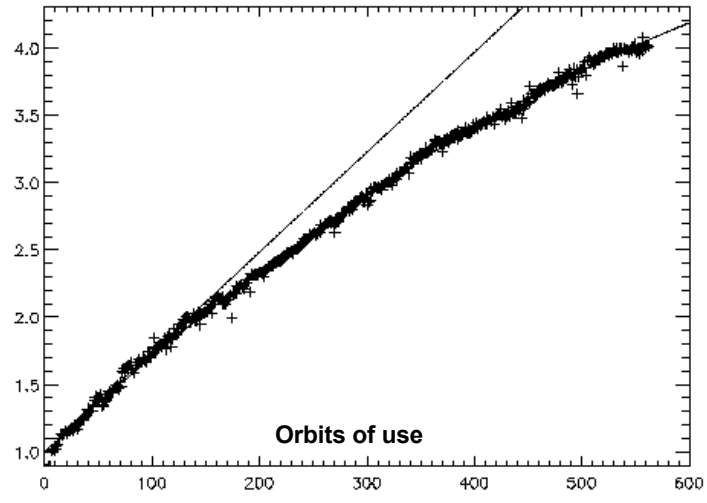
Total gain increase

- Increase is slowing down from 0.8% to 0.4% oer orbit



Anode status

- ~So far – on average 2-3% loss per year (256 anodes in total), but now about 1% per year
- However, no loss during ~12 months period in 2007-08
  - Two strips lost in 2008 and one recently in March 2009
- JEM-X1 (~600+ orbits of use)
  - 59 of 256 anodes affected (almost 25% of area)
    - 37 dead (4 pre-launch)
    - 14 neighbor
    - 11 unstable or low
- JEM-X2 (~200 orbits of use)
  - 51 of 256 anodes affected
    - 33 dead (9 pre-launch)
    - 15 neighbor
    - 3 unstable or low

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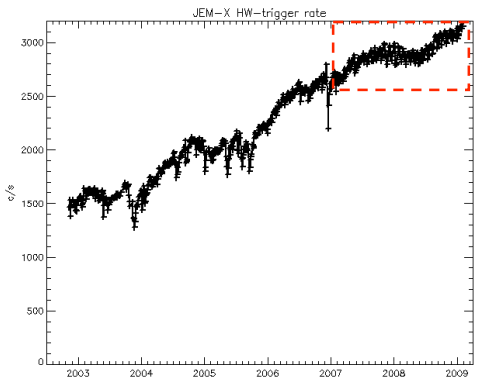
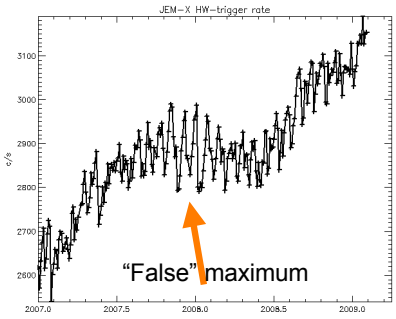
JEM-X particle trigger rate

- New solar cycle has started in 2008, but solar activity is **VERY** low
  - But no serious decline in particle background yet
  - "False" maximum seen in the particle rate seen at the end of 2007
  - Note that this is **not** the background rate in JEM-X science data – deadtime has only increased from 13% to about 20%





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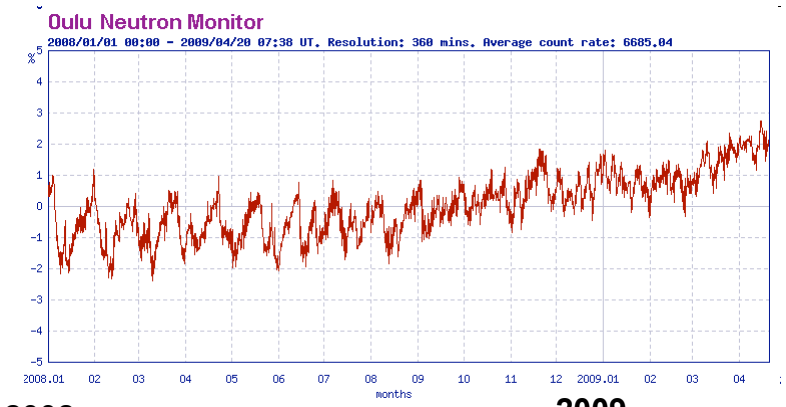
Oulu neutron monitor, still going up!



2008 **2009**

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Switching from JEM-X1 to JEM-X2

- JEM-X1 has been the default instrument since rev. 170
  - JEM-X1 has operated 600+ revolutions
  - JEM-X2 has operated about 200 revolutions
- Planning to switch at beginning of AO7
- Consider using both units when “the end is near”
  - Makes only sense when the telemetry situation has improved to allow at least a 5+5 tm allocation
  - However, both units are used during SPI annealing (Now!)

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JEM-X software – OSA 8

- OSA 8 will include new version of imaging sw, j_ima_iros
  - Electronic efficiency as function of gain implemented for better flux determination at low energy
  - Improved off-axis response corrections
  - Improved model of evolution of response over time
  - j_ima_iros now being tested/delivered to ISDC
  - OSA 8 release in May (hopefully)
- OSA 8 will also include
  - Better gain fitting
  - Updated mosaic software
- Note: Source detection limit is determined by systematics (detailed model of collimator and effects of lost anode strips)

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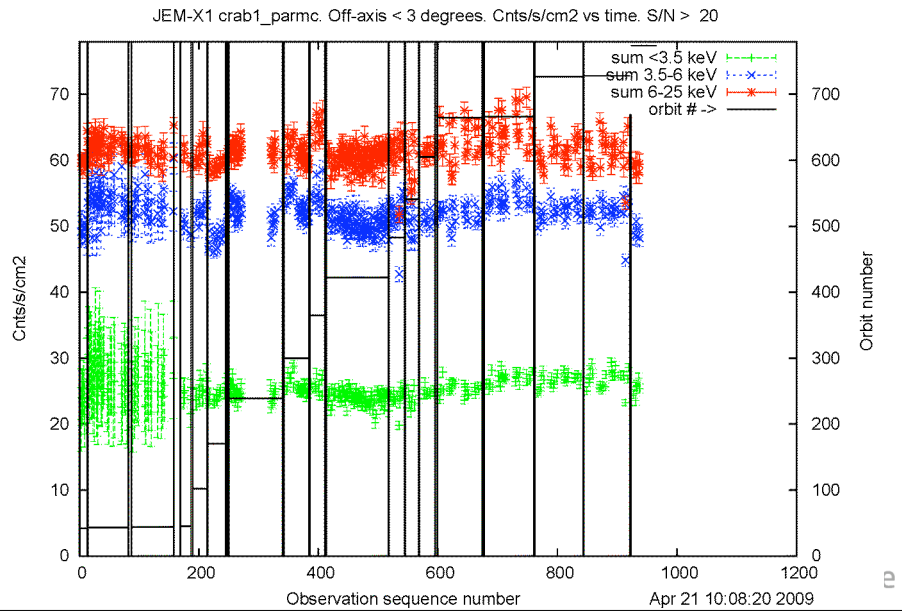
JEM-X1 Crab fits with OSA 8



Conclusion

- JEM-X is running smoothly
- Gain evolution is progressing (as expected)
- Switch from JEM-X1 to JEM-X2 is foreseen by start AO7 (late 2009) to even the “wear” on the detectors
- OSA 8 will improve flux stability very significantly
- Running both JEM-X units to improve statistics is considered when “the end” is near and TM allocation allows
- We expect/hope JEM-X and INTEGRAL to operate through 2012 (and longer?)

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