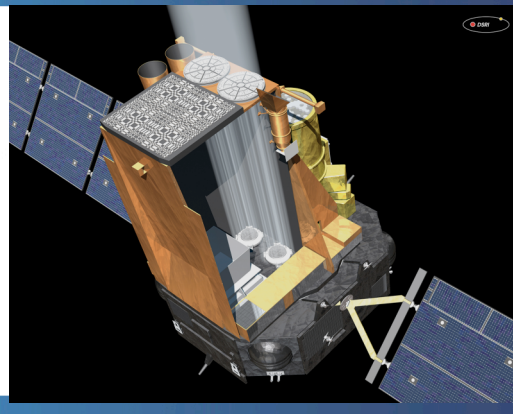


JEM-X Status

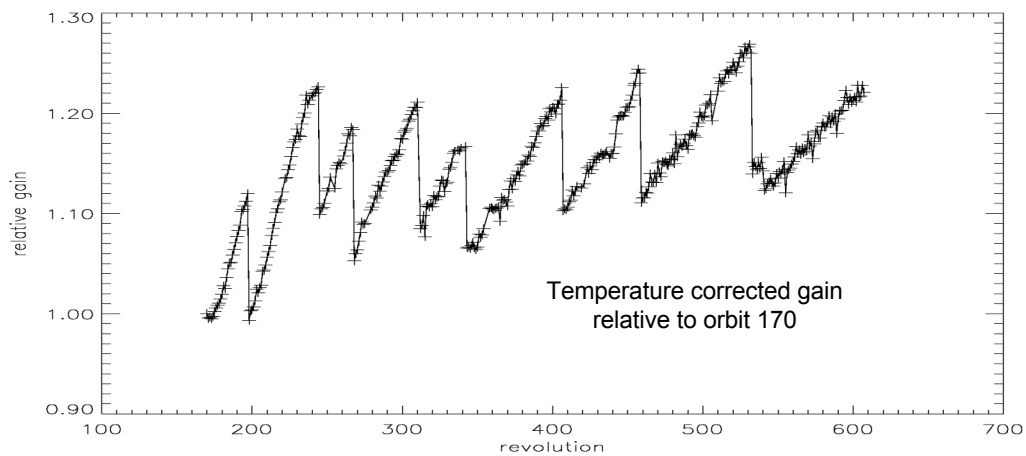
November 2007

Søren Brandt
&
the JEM-X team



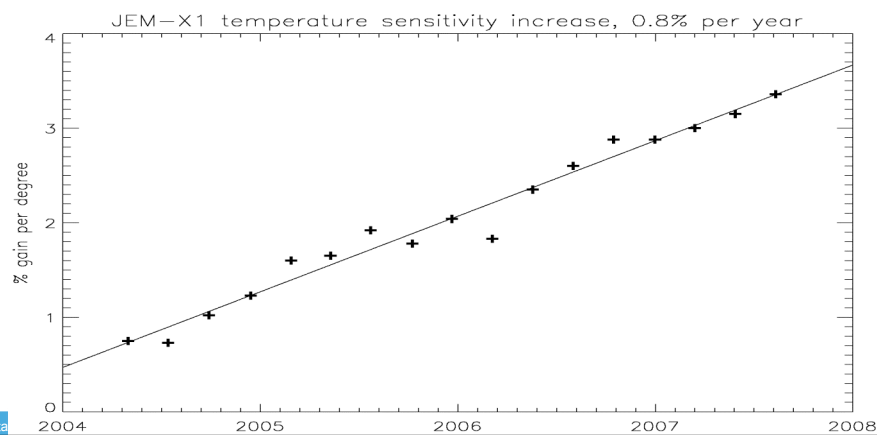
JEM-X1 Gain History

- JEM-X1 DV setting was most recently lowered in orbit 533 to DV=73, next lowering to DV=72 will take place in orbit 623



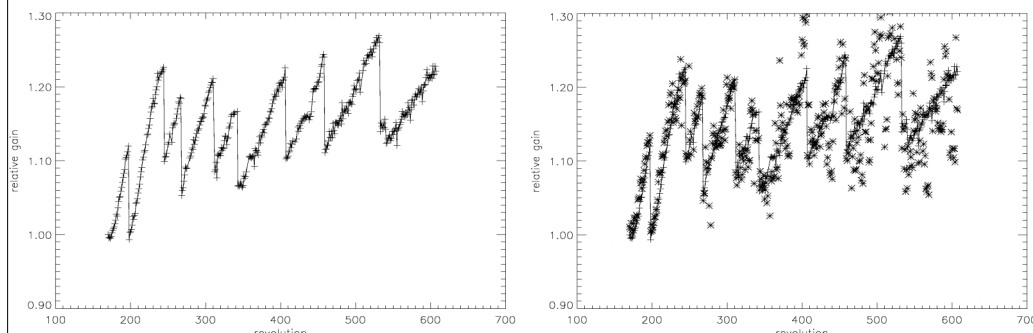
JEM-X gain as function of temperature

- Temperature sensitivity has increased from ~1% per degree to ~3% per degree of detector temperature
- Caused by same effect as the gain increase



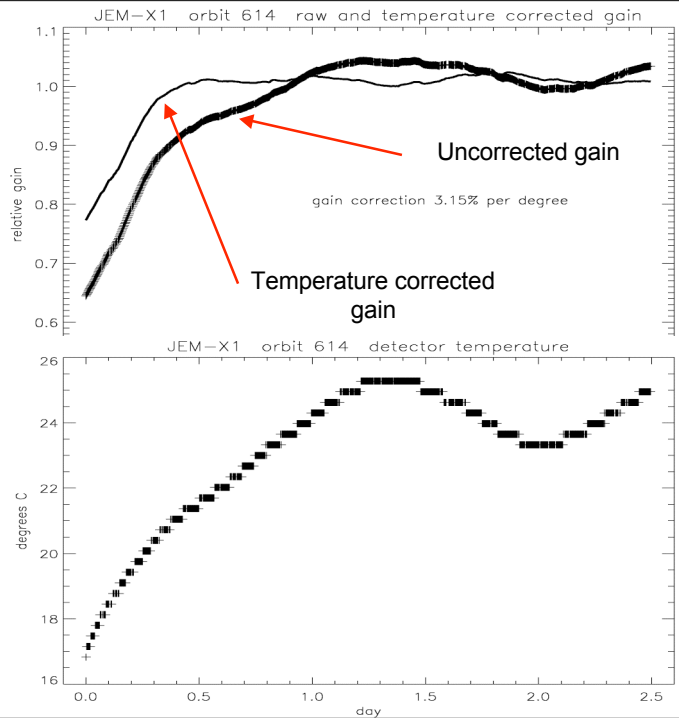
Average gain with and without temperature correction

- The linear trend of gain increase as function of time is most clearly seen, when gain is adjusted for temperature effect



Gain variation due to temperature variation (example)

- Eclipse orbit 614
- 3.15% gain increase per degree



JEM-X gain - the Future

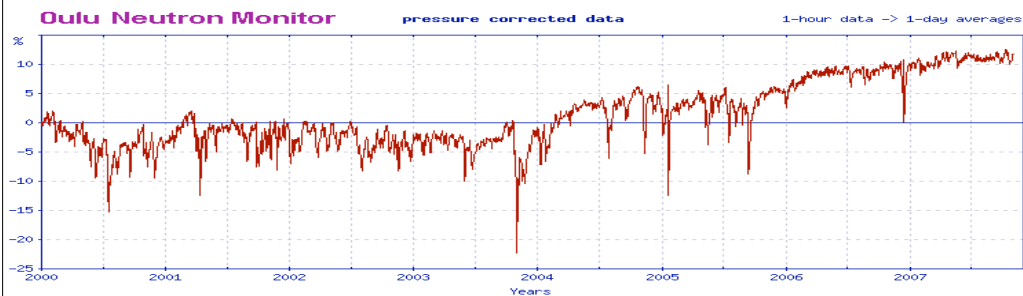
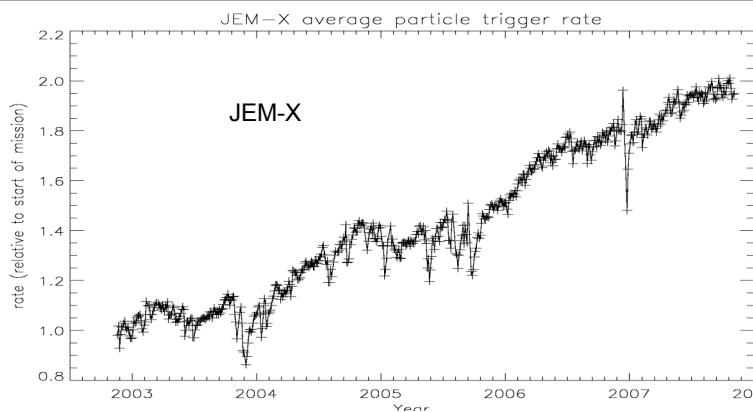
- ~1% increase per orbit relative to original gain
- Gain is reduced 12-14% (relative) per step of high voltage
- After ~450 orbits of use, gain has increased by factor of ~4
- HV reductions still needed, but less frequent (~1 step per year)
- We also expect further changes of the spatial gain map
 - Can be mapped with Xe line at 30 keV
- Gain variations due to temperature:
 - Was: ~1% per degree C
 - Is now: ~3% per degree C

Anode Status

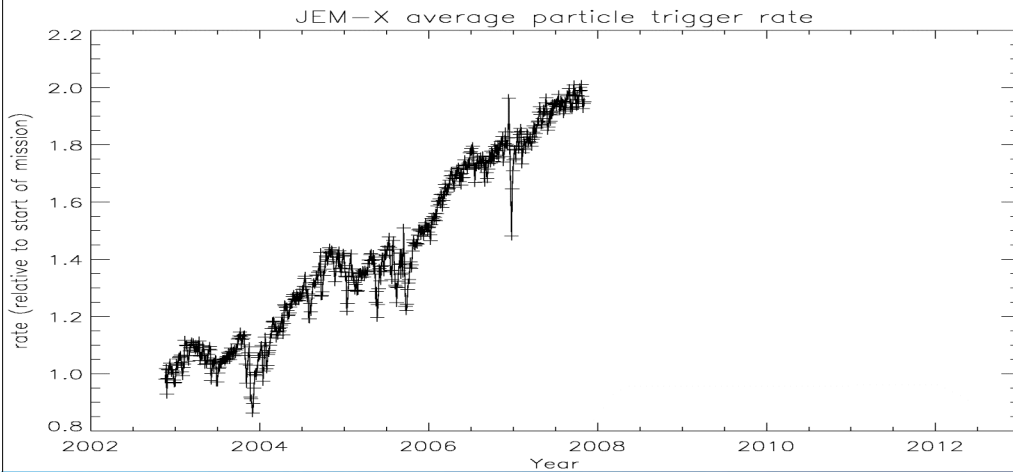
- ~2-3% loss per year
- JEM-X1 (~450 orbits of use)
 - 54 of 256 anodes affected
 - 32 dead (4 pre-launch)
 - 14 neighbor
 - 11 unstable or low
- JEM-X2 (~175 orbits of use)
 - 49 of 256 anodes affected
 - 31 dead (9 pre-launch)
 - 15 neighbor
 - 3 unstable or low

JEM-X particle trigger rate

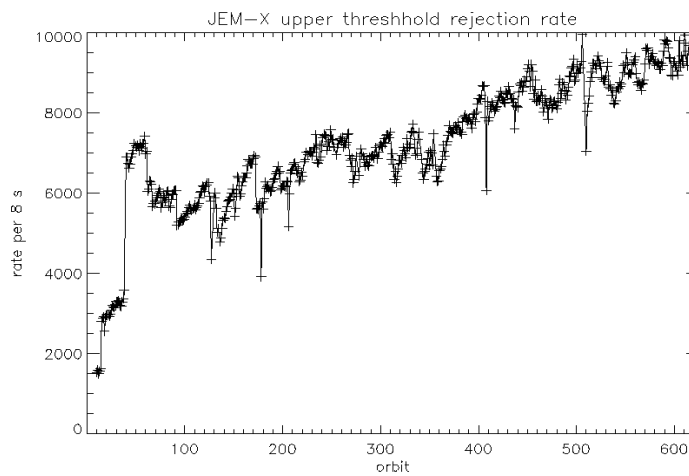
- HW triggers up by a factor ~2 since launch (solar min)
- No impact on accepted events
- Increases dead time, from ~12% to ~18%



JEM-X particle trigger rate



Number of rejected particle events exceeded ISDC limit of 10000 per 8s and was raised to 15000 per 8s



Conclusions

- JEM-X is stable (SW+HW)
- Hot spot activity is low
- Particle background is relatively high (but may be leveling off)
- Better understanding of sensitivity and resolution as function of gain is accumulating
- Better dead time/grey filter correction factor implemented
- JEM-X1 gain has now increased by a factor of 4
 - We may consider switching to JEM-X2 at some point
- ...all is well

Overview of JEM-X count rates and gain per orbit is found at:
<http://www.spacecenter.dk/~sb/JEMX/HK.htm>