JEM-X: Thermal alignment effects

CBJ, SB, NJW, NL
DNSC

JEM-X Cross-Correlation

Skyim = Detim*Mask

Skyim(u,v) = $_i$Detim(x_i,y_i), where $Mask_{u,v}$(i) open.

JEM-X: Analog Imaging. Energy dependent position resolutions.

Pixel Size ? < mask hole, in most cases 1.5 mm.
Skyim: 525x525 pixels (13x13 deg) of 1.5'x1.5'.

Skyim/Bckim/RMSim

Detim: Crab on-axis

Source Finding

1 pixel: 1.5'x1.5'

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JEM-X PSF

$$N=N_{peak}*f_{dead}*f_{coll}*4/3$$

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Source Localization

JEM-X1 Misalignment:

4000 detections of strong sources in Orbit 270 to 320.

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Source Localization

The JEM-X alignment was determined from 4000 detections (> 1 year) of well known sources: Cyg X-1, Cyg X-3, GRS 1915, Ser X-1, Sco X-1, GX 17+2, GX 9+1, GX 5-1, etc

Detection Significance and Off-axis Angle

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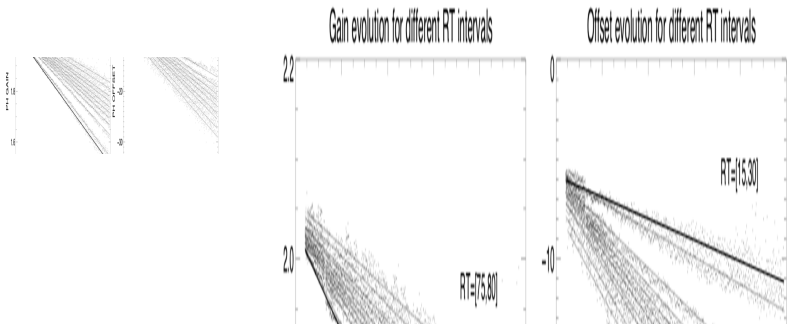
Source Localization

Contour lines of 95% confidence radii (arcseconds)



1 Crab source, 1000 sec, on-axis: $r_{95\%}$ = 7”

1 Crab source, 1000 sec, 3 deg : $r_{95\%}$ = 22”

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Source Localization

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Mask Temperature

Slope = 0.42 arcsecond/deg C

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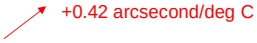
Source Localization



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