



The First Light from MAXI onboard JEM (Kibo)-EF on ISS

M.Matsuoka

JAXA/RIKEN

on behalf of MAXI Team

X-Ray Astronomy 2009

Bologna, Sep. 9, 2009



Congratulations on Prof. Giorgio Palumbo 70th birthday

- Japanese legend originated from Chinese poet, Toho, gives 70 years old person a special celebration.
- Toho's poem suggests that the person who is able to live up to 70 years old is very rare historically in 8th century. Therefore a 70 years old person should be celebrated. This is a traditional Japanese custom.
- Since 70 years old persons are not rare nowadays, I think Giorgio can of course enjoy new advanced life over 70. Giorgio will give us useful advises with his activity.
- Please take care your health, thus hoping to enjoy your further life.



MAXI Science Team



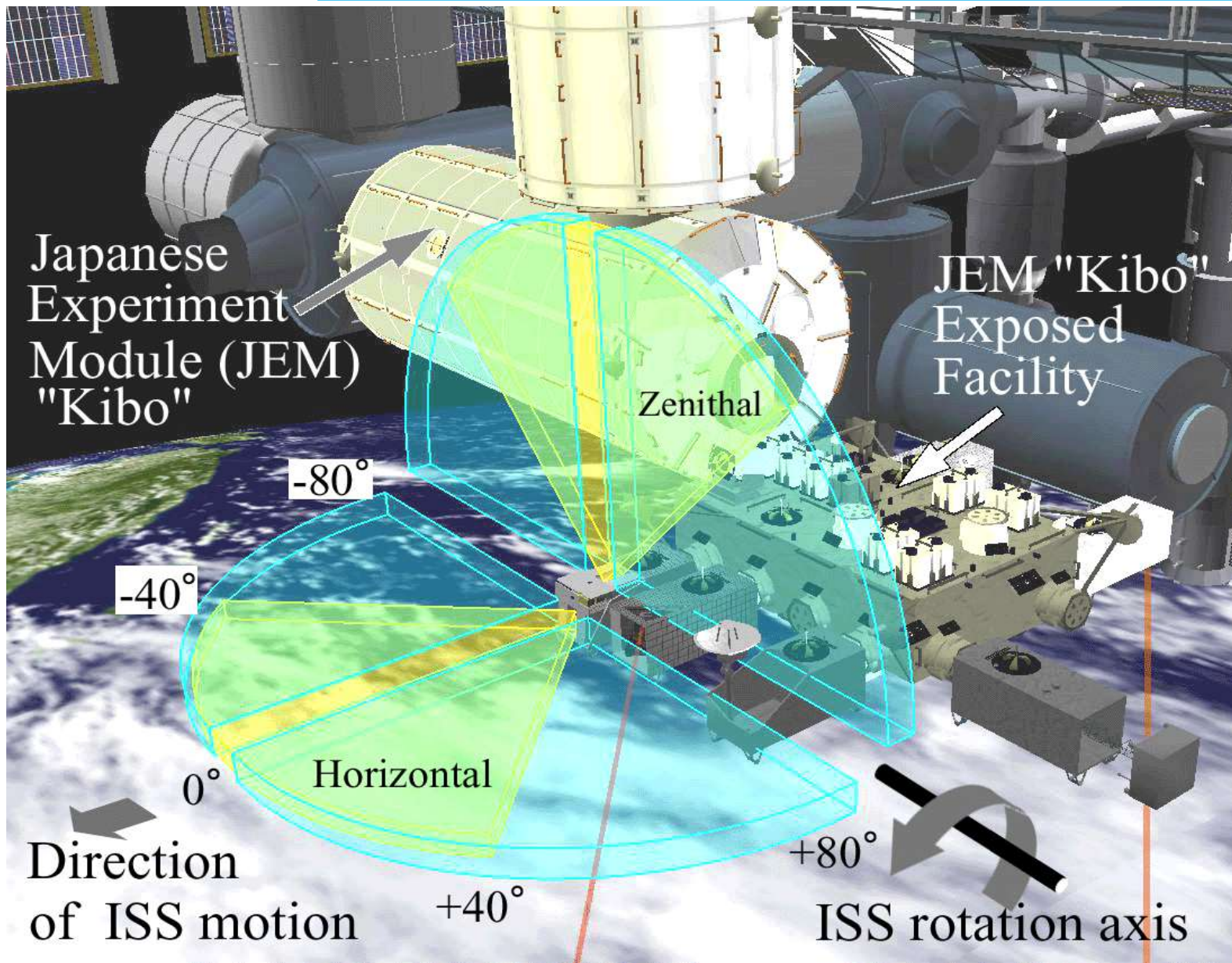
- **JAXA:** M.Matsuoka, K.Kawasaki, S.Ueno, H.Tomida, M.Kohama, M.Suzuki, Y.Adachi, M.Ishikawa, Y.Itamoto, H.Katayama, K.Ebisawa
- **RIKEN:** T,Mihara, M.Sugizaki, Y.Nakagawa, T.Yamamoto
- **Osaka Univ.:** H.Tsunemi, M.Kimura
- **Tokyo Inst. Tech. :** N.Kawai, M.Morii, K.Sugimori
- **Aoyama Gakuin Univ.:** A.Yoshida, K.Yamaoka, S.Nakahira, I.Takahashi
- **Nihon Univ. :** H.Negoro, M.Nakajima, S.Miyoshi, R.Ishiwata, H.Ozawa
- **Kyoto Univ.:** Y.Ueda, N.Isobe, S.Eguchi, K.Hiroi
- **Miyazaki Univ.:** M.Yamauchi, A.Daikyuji



Brief History of MAXI

- 1997.3 : MAXI was approved.
- 2009.7.16: MAXI was launched with Endeavour.
- 2009.7.24: MAXI was attached to JEM-EF.
- 2009.8.3: MAXI started switch-on.
- 2009.8.18: GSC was set up. → The first image.
- GSC is adjusting instrument for steady observation up to end-November.
- 2009.8.9: CCDs of SSC were cooled with Peltier-on. → Adjusting & test obs up to end-November.

MAXI Field of View



FOV of GSC
160° X 1.5°

FOV of SSC
90°x 1.5°

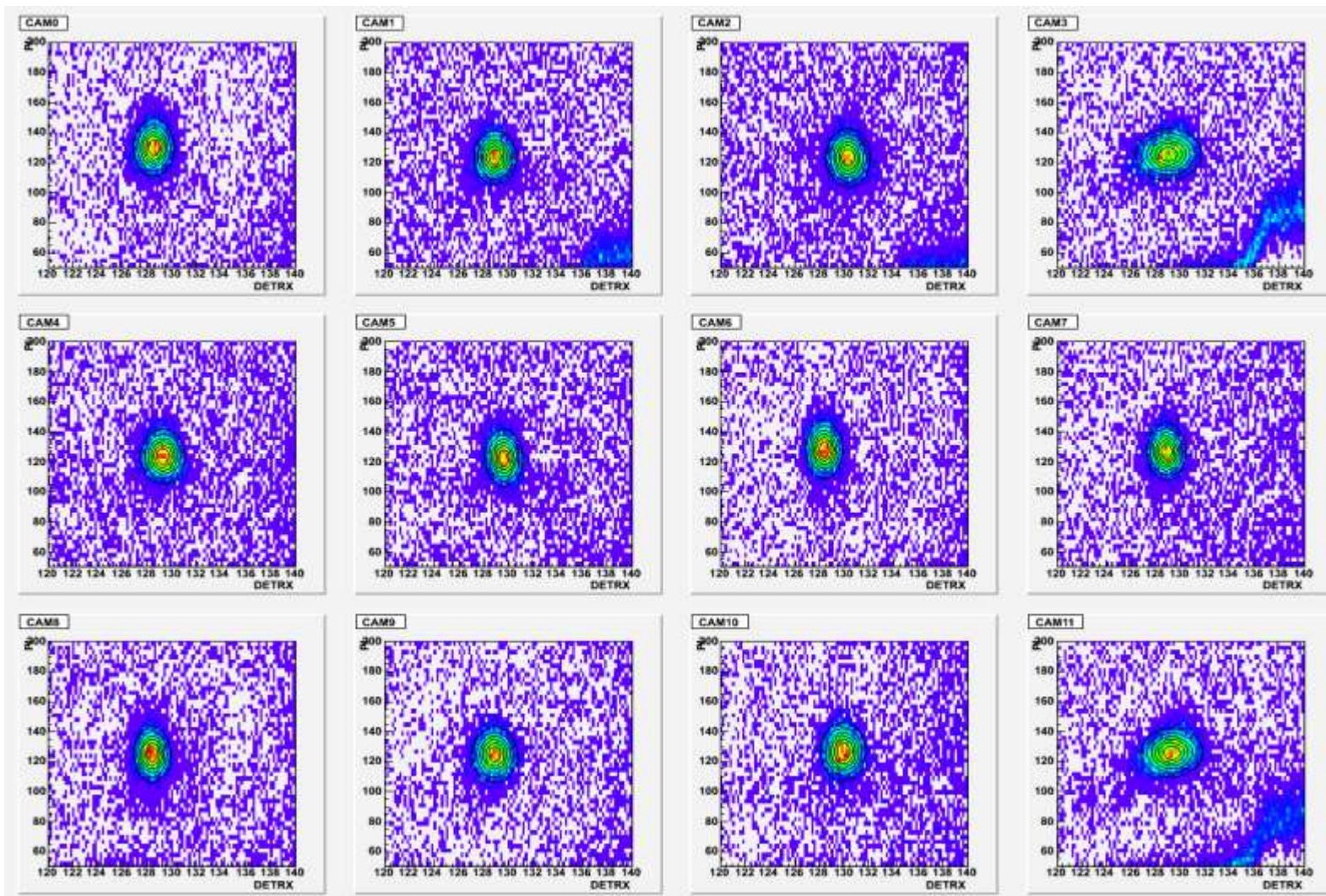


Fe⁵⁵ cal. Data for 12 PCs PH vs. Position



Data:8/18/09
(Nakahira)

One day
data!



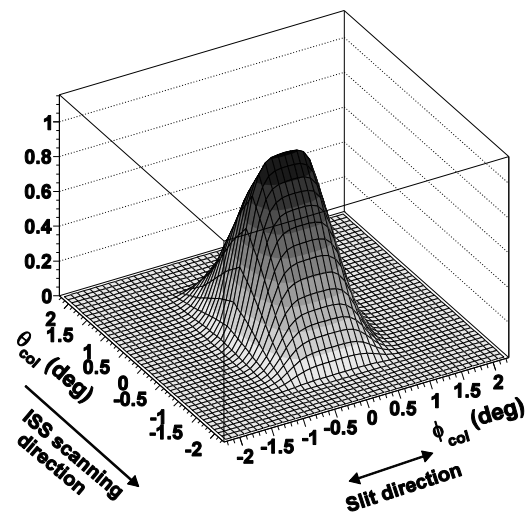
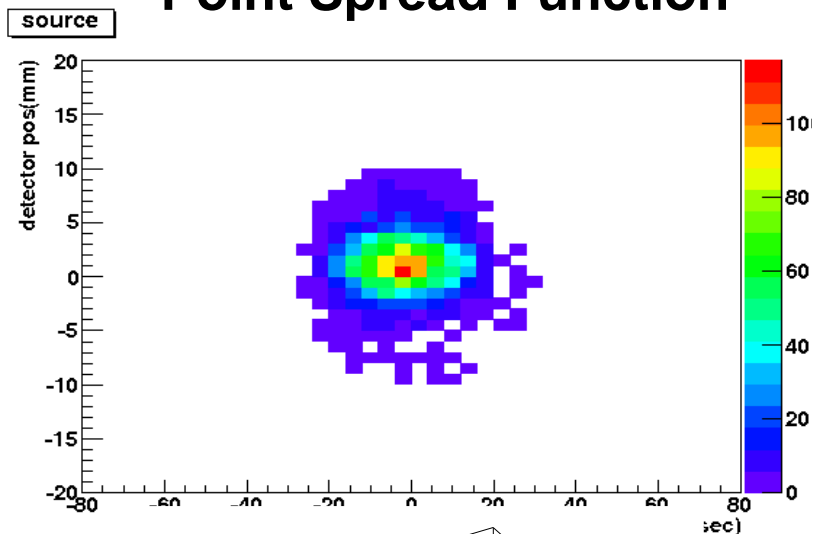
Energy
Position

Sco X-1 response

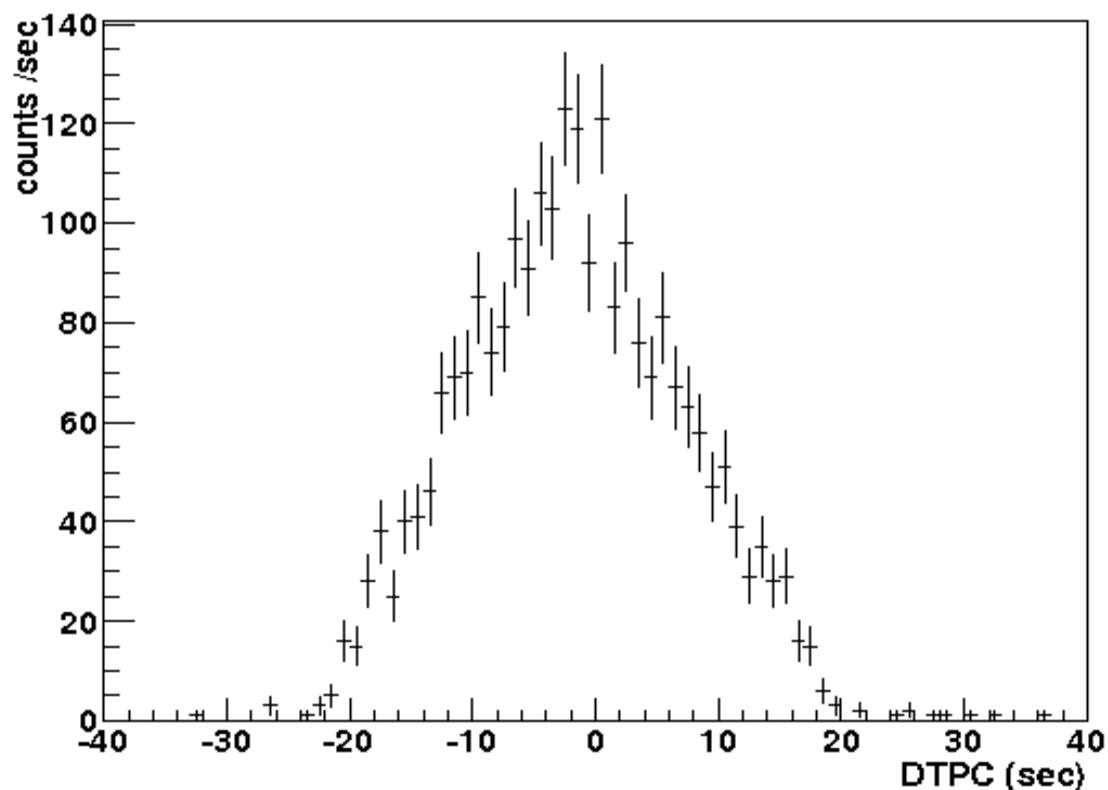
one for GSC detector 2009.8.10

Sugizaki

Point Spread Function



sourcecurve



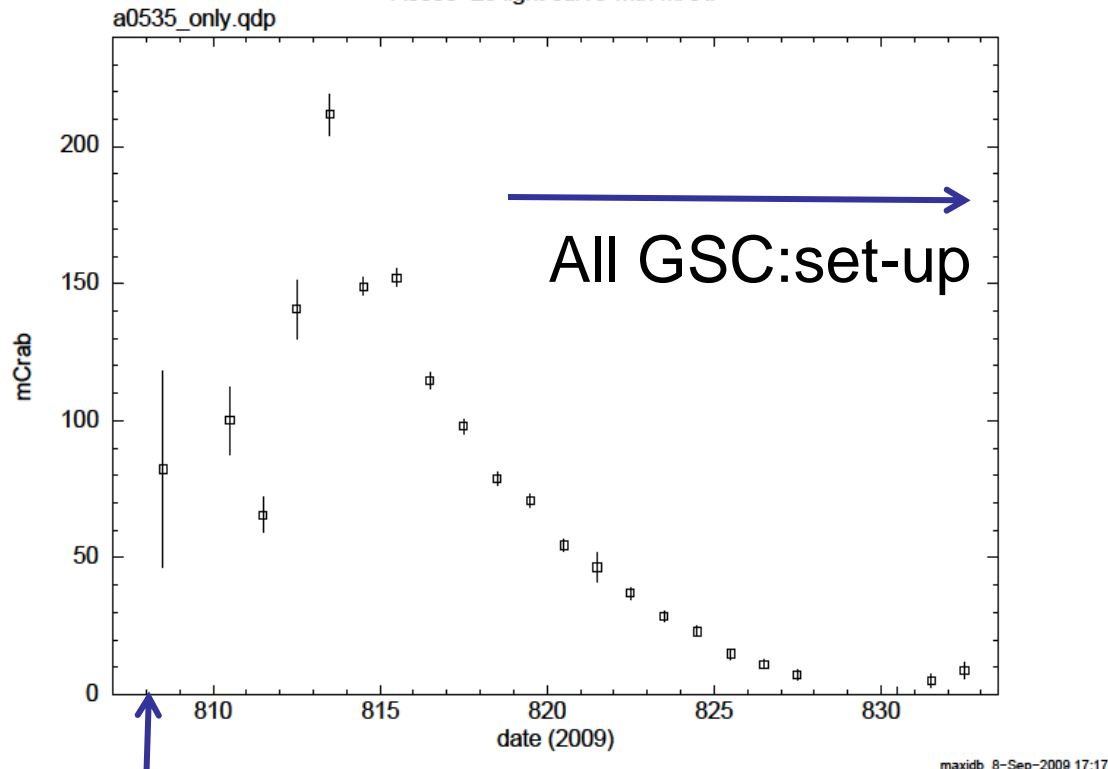
BtoB 3 degrees for triangle response

Crab/A0535+26 → Detectability

Nakajima/Mihara

A0535+26 Light Curve

A0535+26 light curve with MAXI



Data:

Crab : 900 counts/2PC/40sec

BGD : 40 counts/2PC/40sec

1σ of BGD : $\sqrt{40}=6.32$

5σ : $6.32 \times 5 / 900 = 35$ mCrab

$35 / \sqrt{2} = \mathbf{25 \text{ mCrab}}$

Detectability for best case, but future issue:

One orbit for 4 PC ~ 25 mCrab

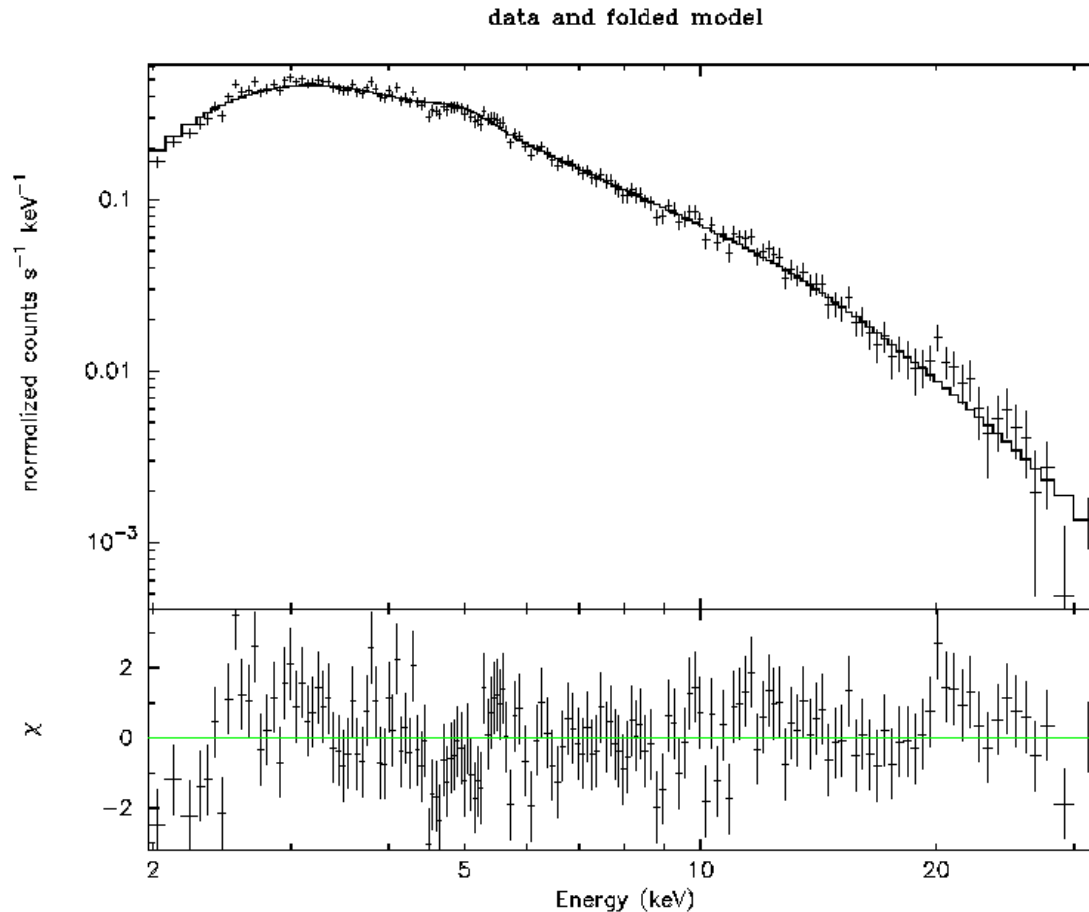
One day < 8 mCrab

One week ~ ? mCrab

One month ~ ? mCrab

Crab Spectrum

8/18/09
Sugizaki



Power-law
Phon-index ~ 2.1

N_H ($\sim 10^{22}$) should be calibrated in future.



First Image for One Scan

2009.8.18 (Sugizaki)



77% of All Sky !

Solar Region: $50^{\circ} \times 160^{\circ}$

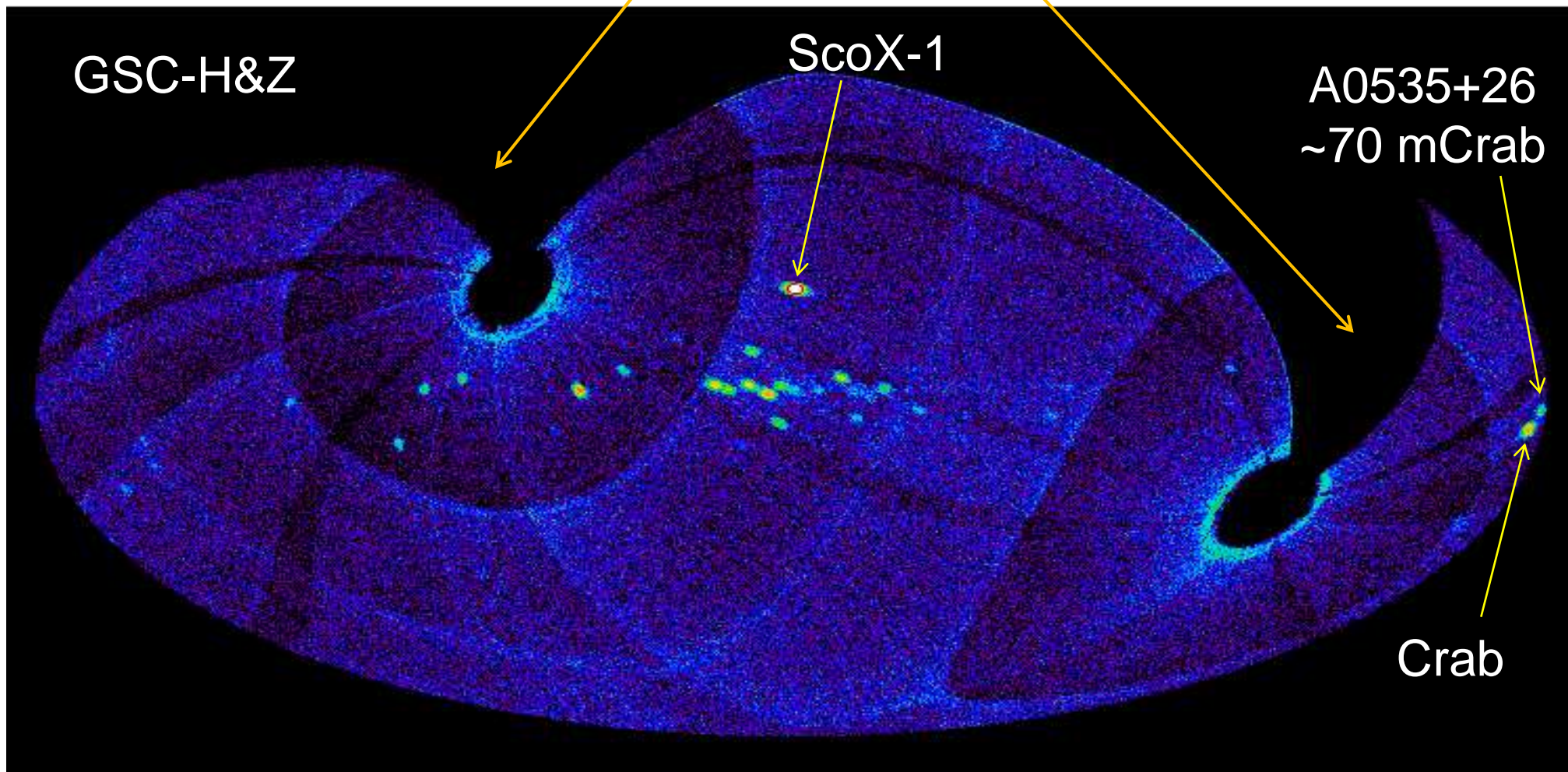
76%

GSC-H&Z

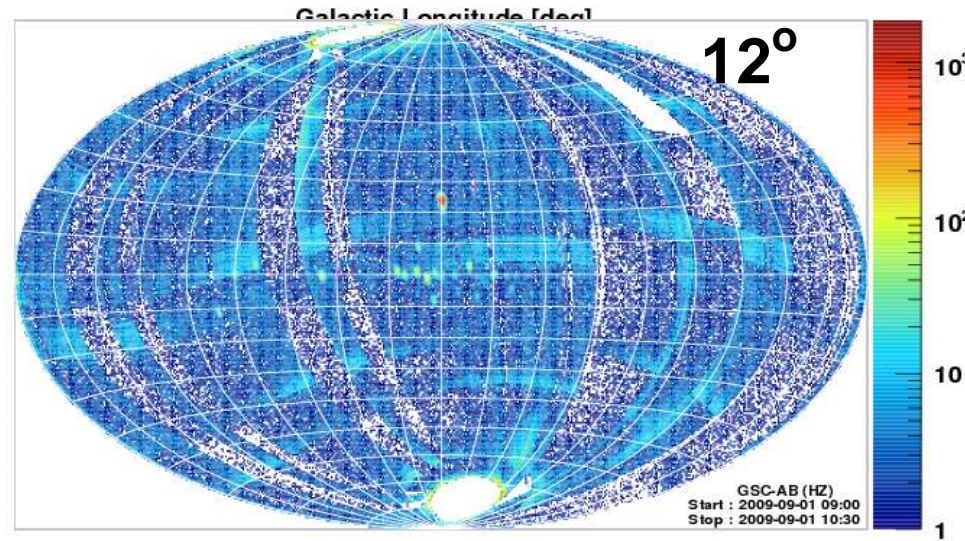
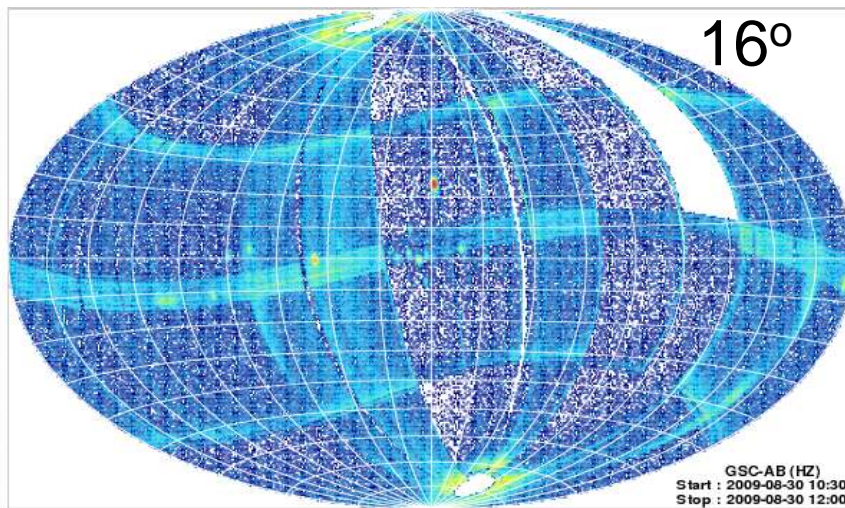
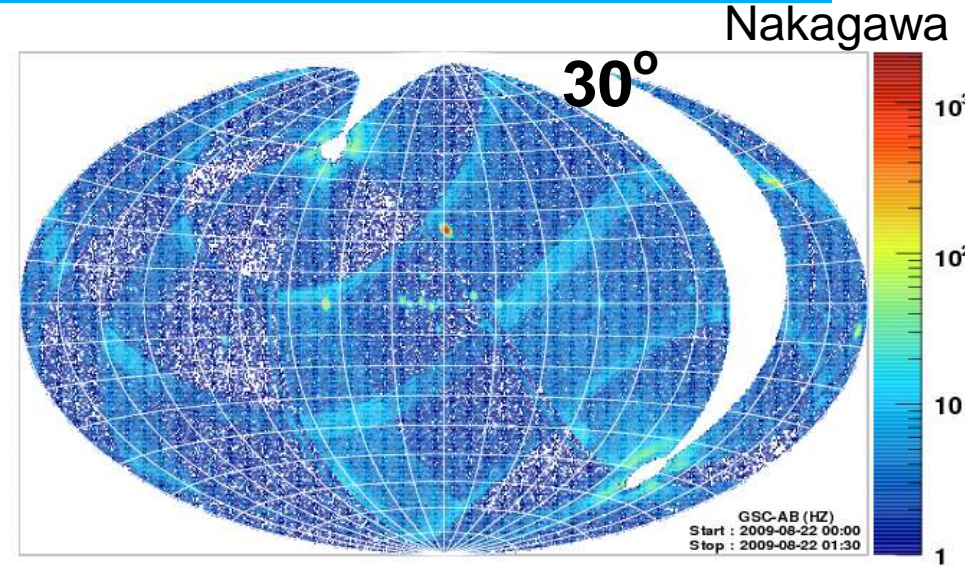
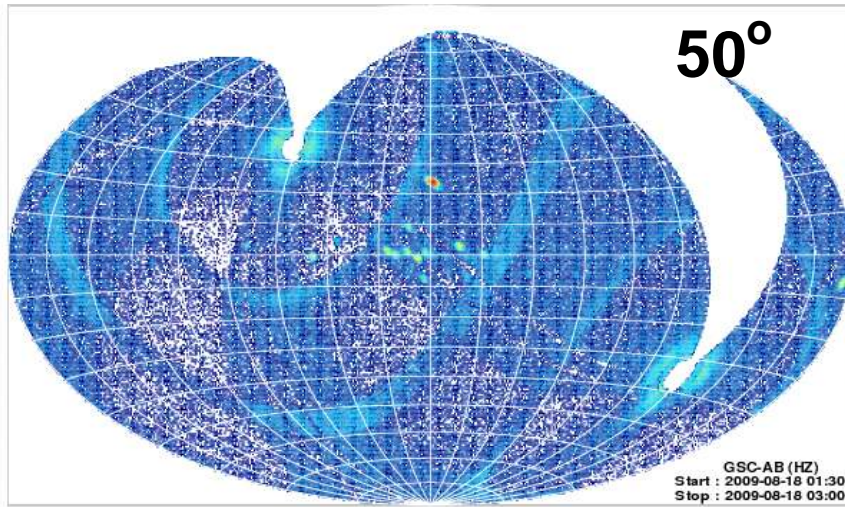
ScoX-1

A0535+26
~70 mCrab

Crab



Sky Coverage \rightarrow 95%/orbit! (10° Sun)



Nakagawa

One Day Image

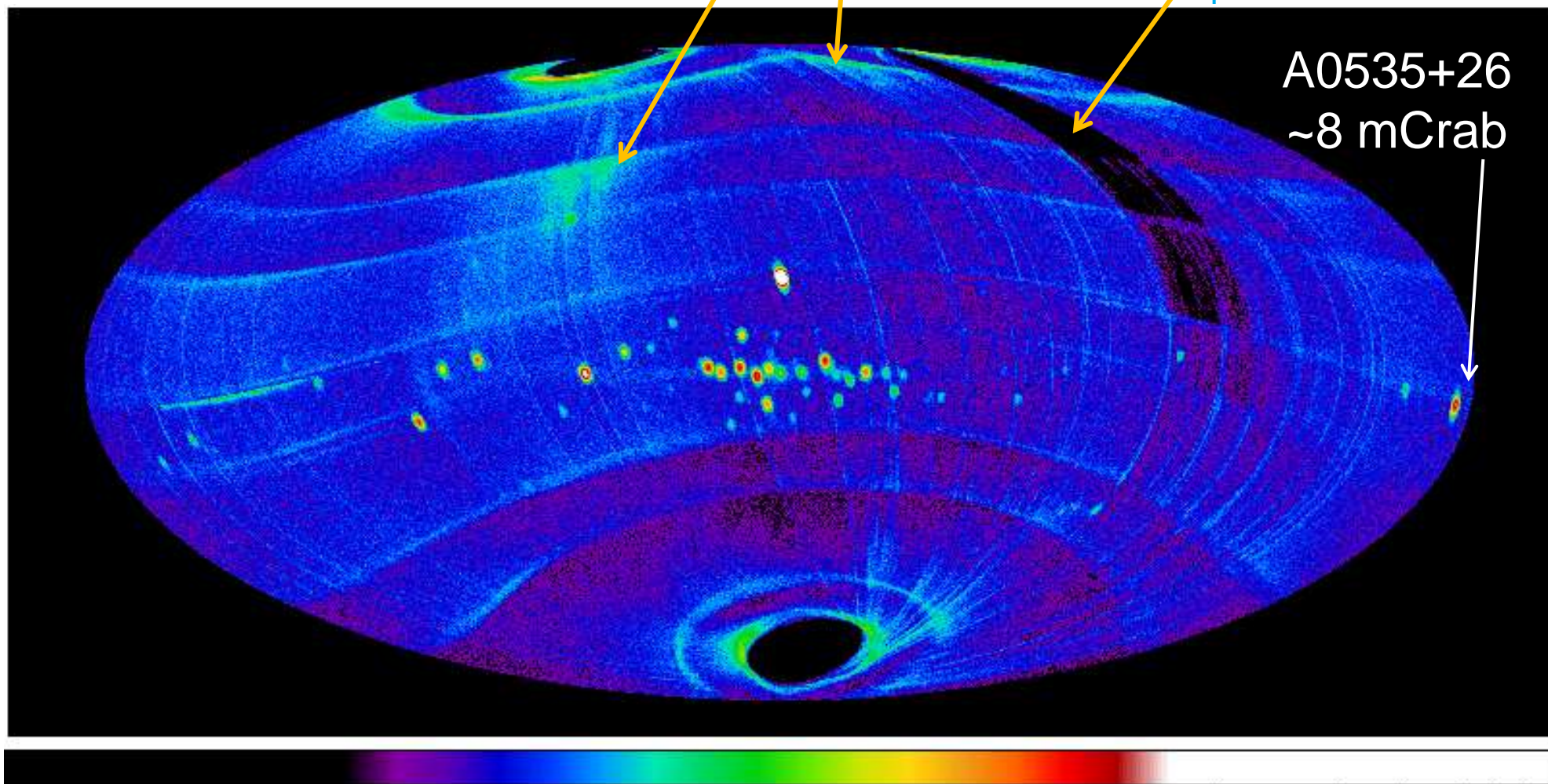
2009.9.2 (Sugizaki)



~95% of AllSky !

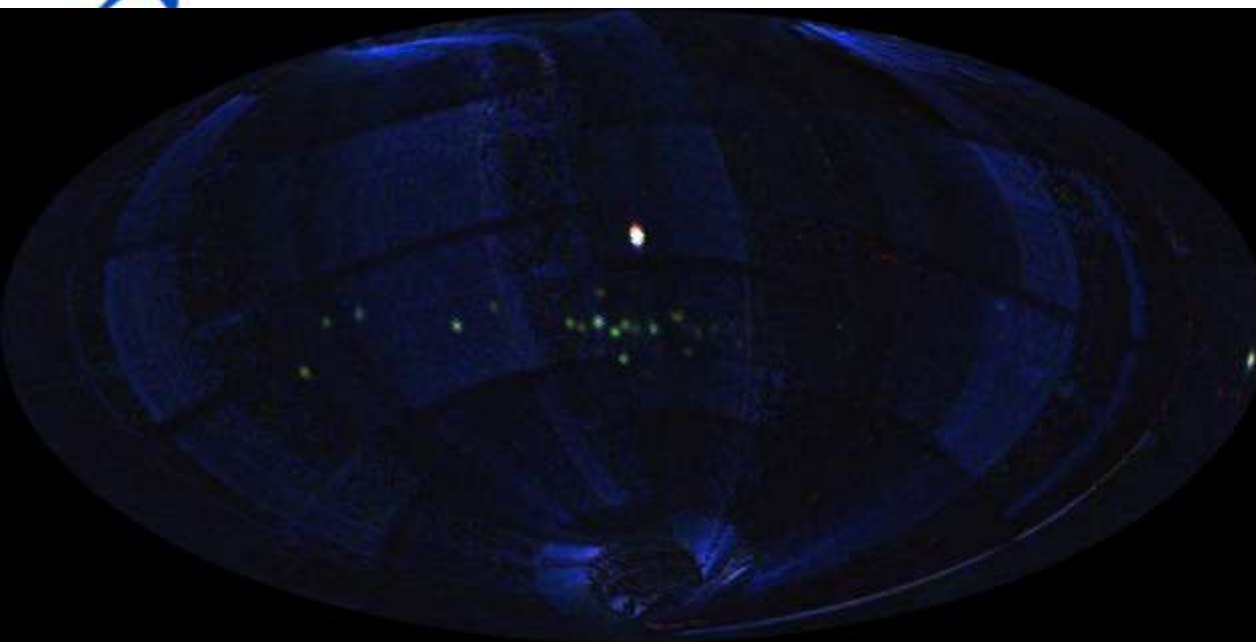
No cut of high BGD regions

Solar Region
 $12^\circ \times 80^\circ$



4000

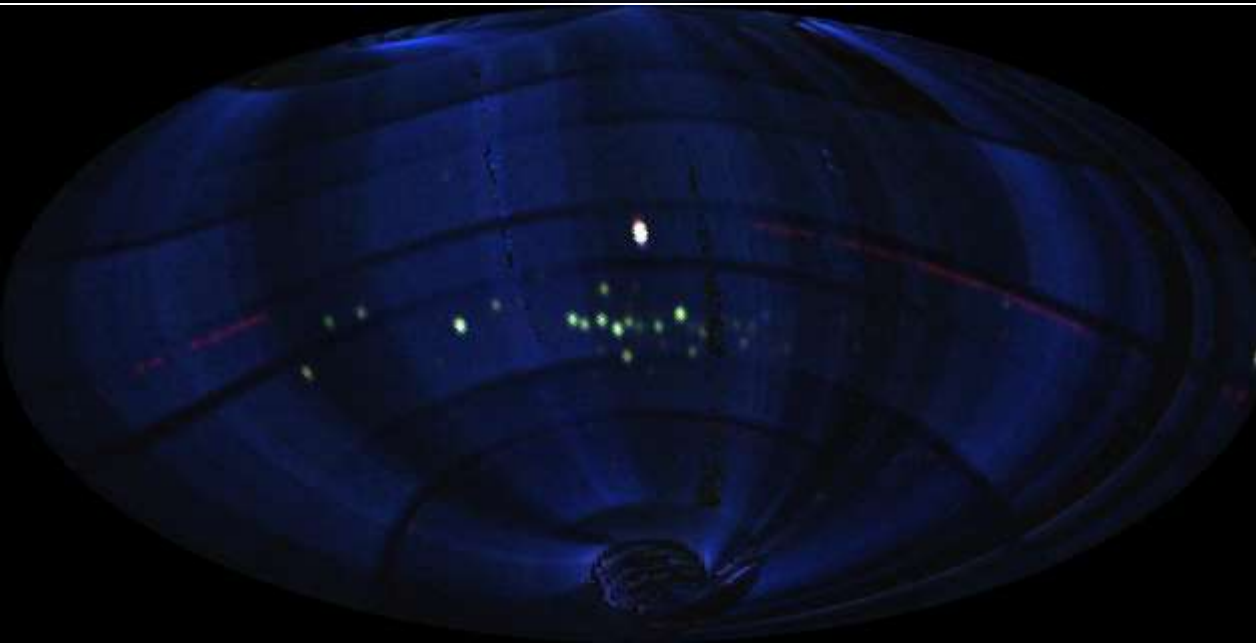
10000



Ask Negora-san for
details in poster !



One orbit map in real
time! 2009.9.4
>25 mCrab.



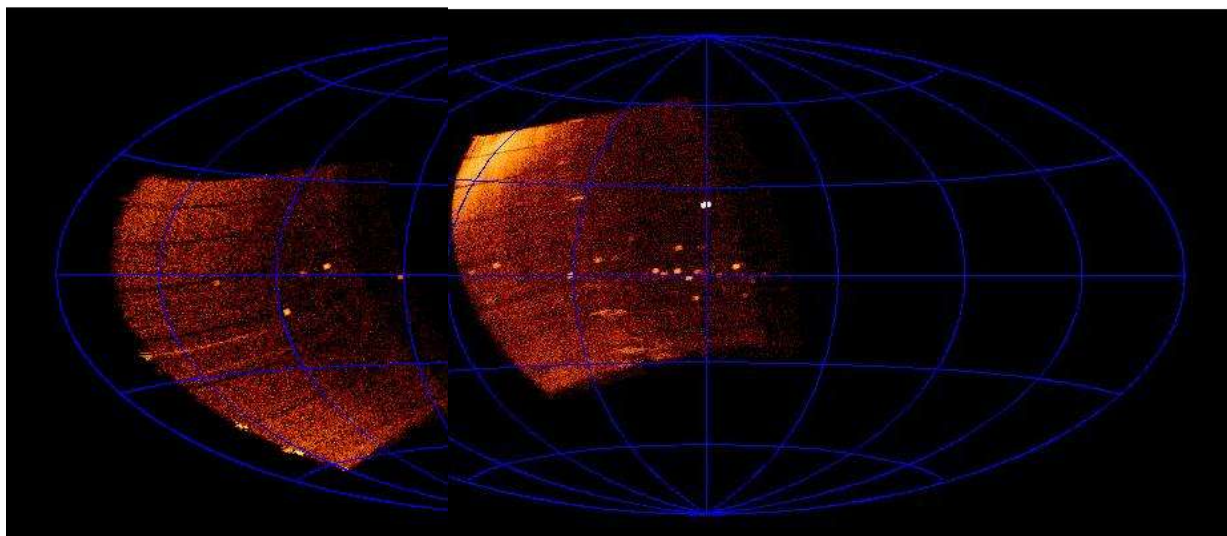
4 orbit map!
2009.9.4
>15 mCrab.



SSC Images of Night Observations



Kimura, Tomida,



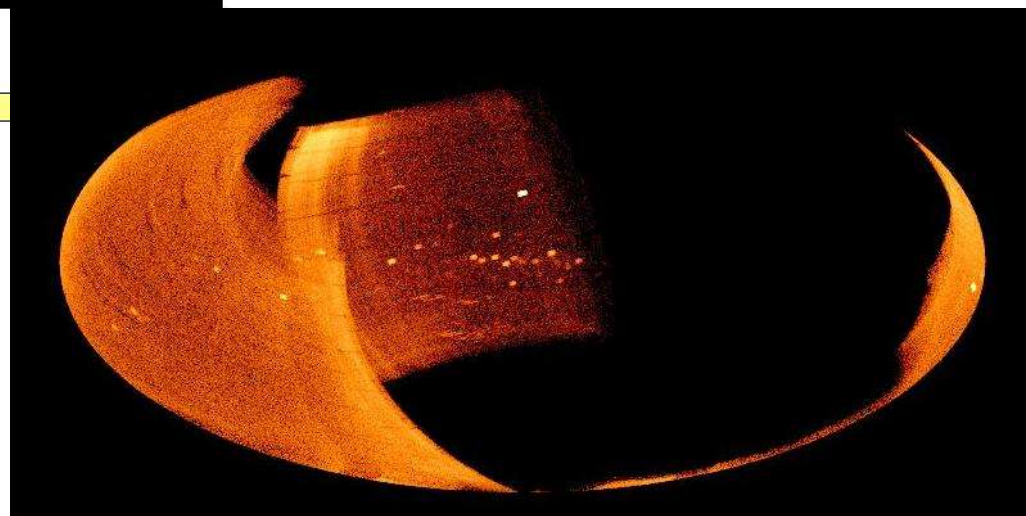
SSC-H
(one day)

SSC-Z
(one day)

Only night observations
in 1-9 keV, day time obs.
coming soon!

CCD temperature:
about -60°C

SSC-Z
(~one week)

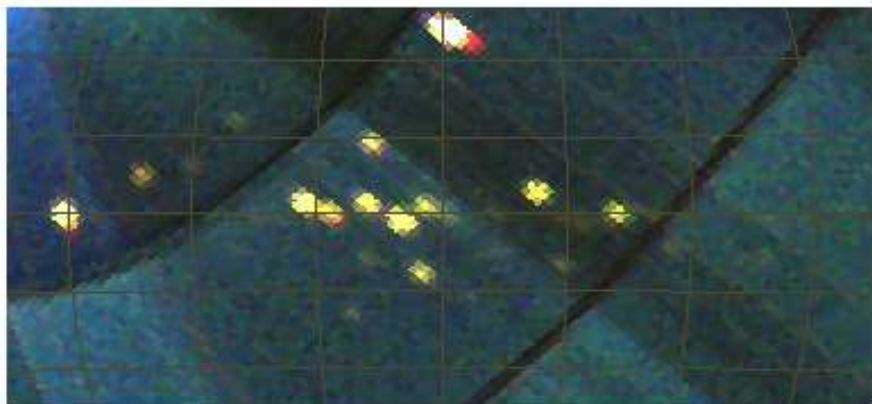




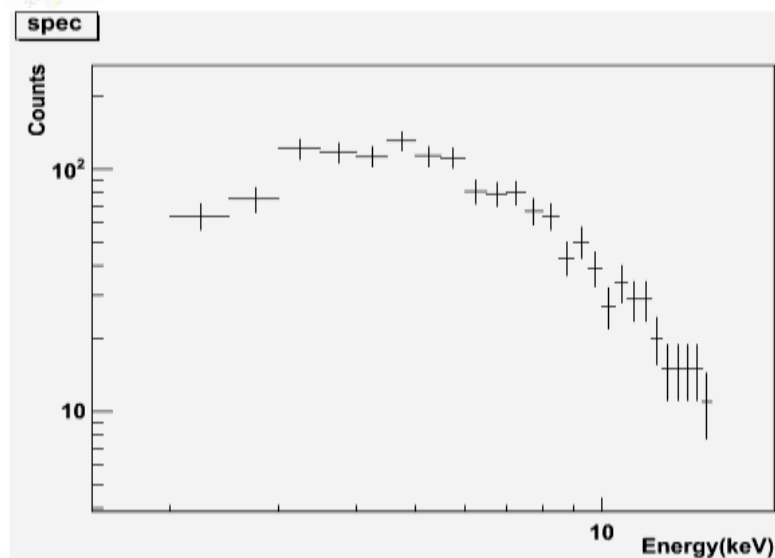
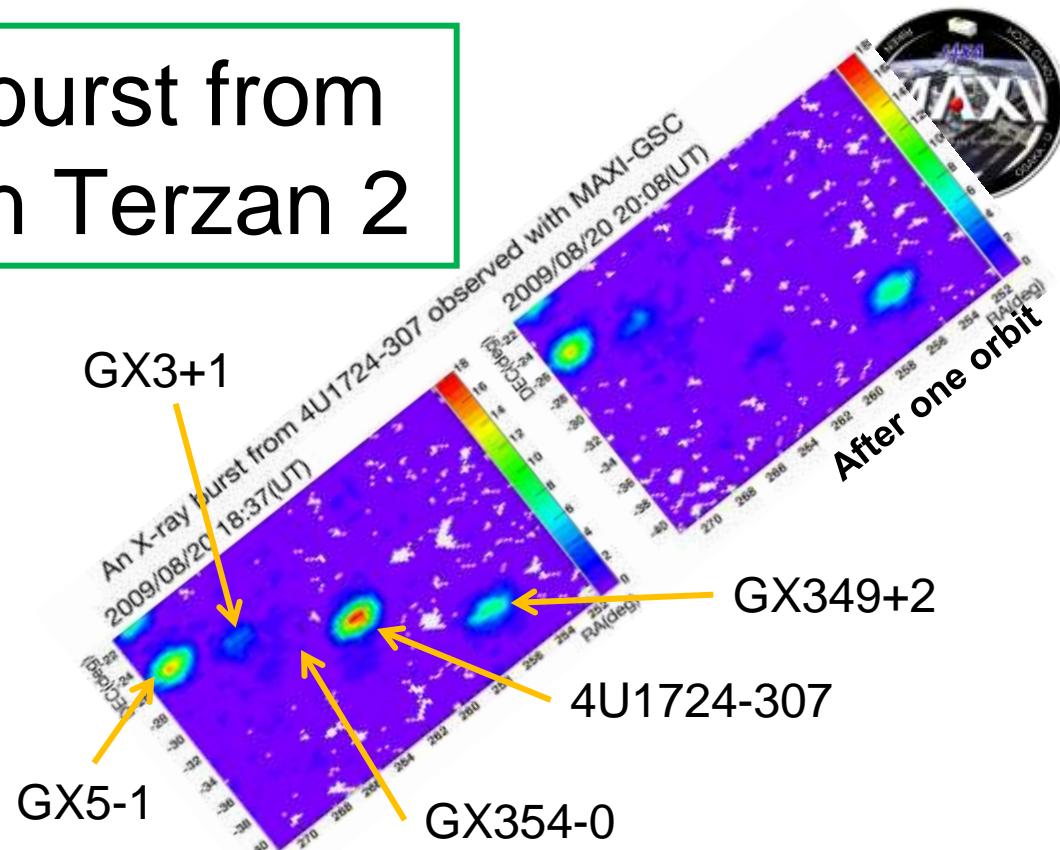
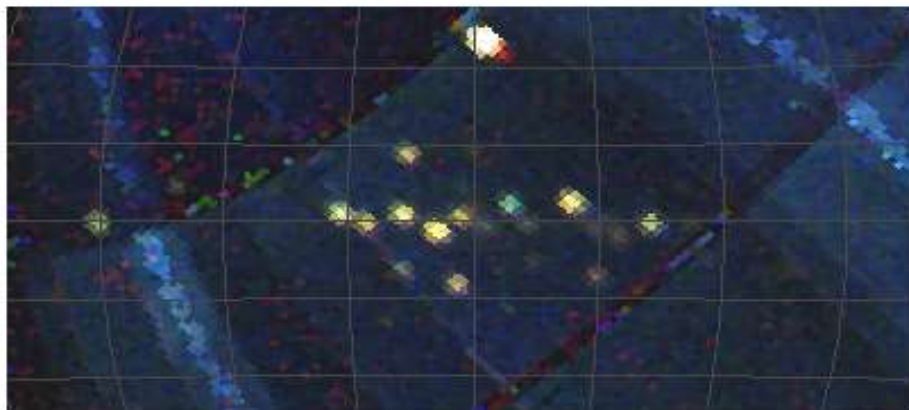
Type I X-ray burst from 4U1724-307 in Terzan 2

Ozawa, Nakahira

2009/08/19 20 (JST) 4 orbit average



2009/08/21 11:00(JST) 1 day average



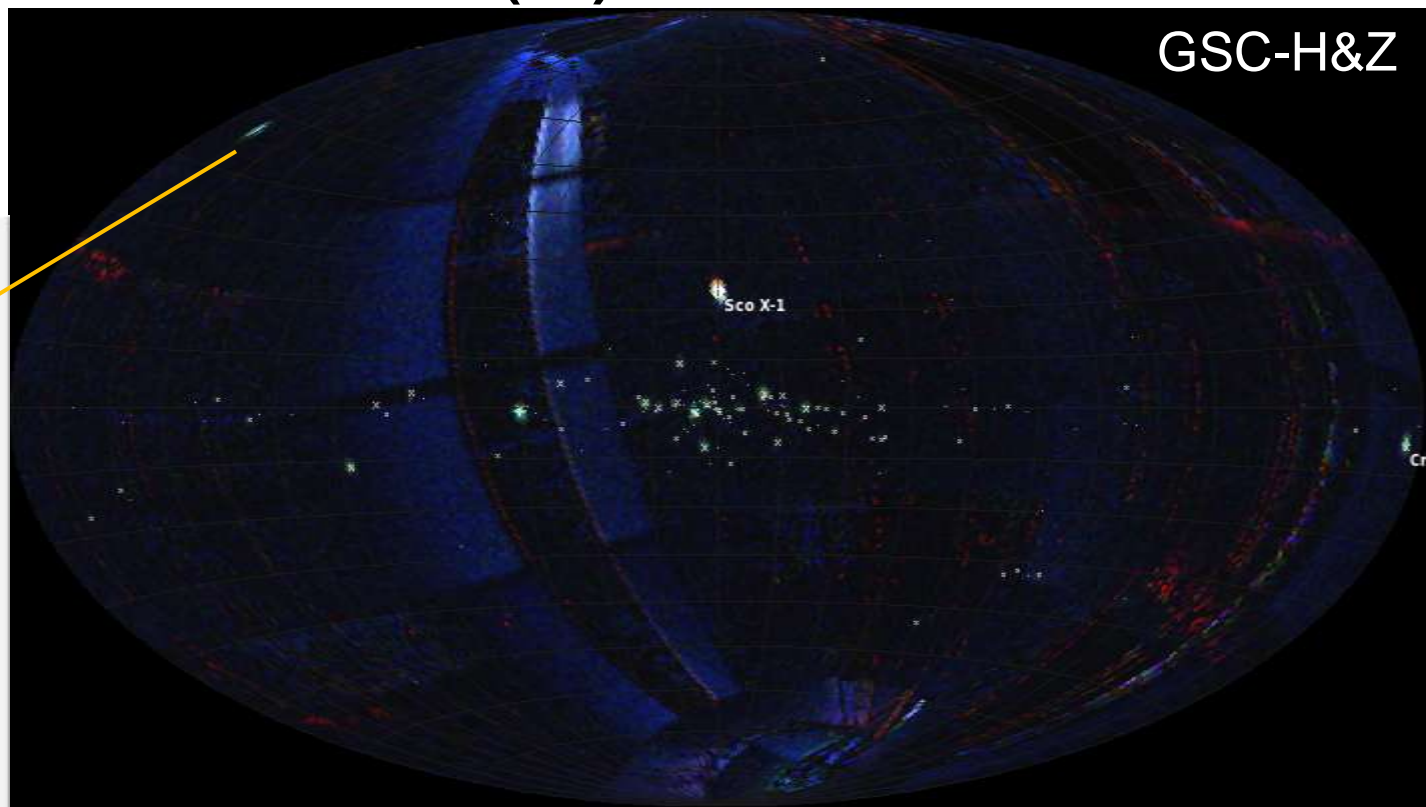
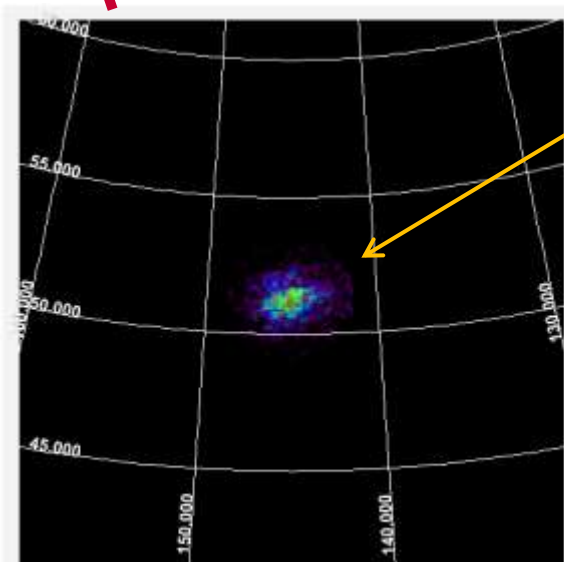


Miyoshi

Detection of GRB090831A(1) GCN 9852



Preliminary!



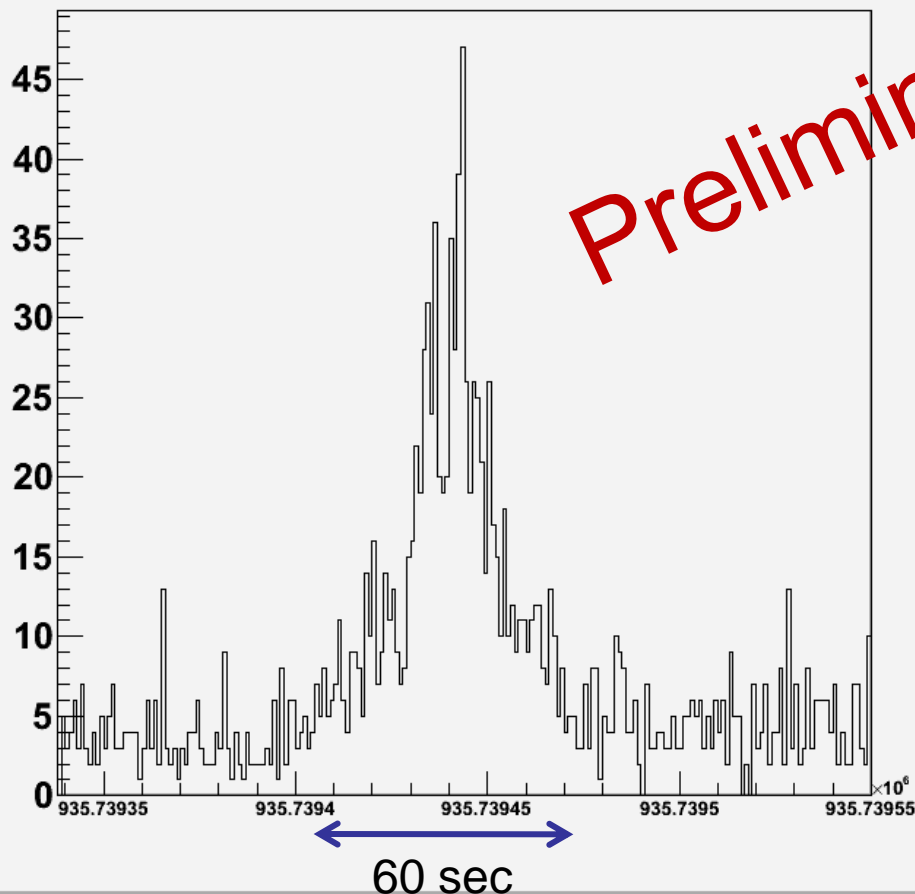
- ★ GRB090831: RA=9^h41^m36^s, DEC=+51°24'00"
[uncertainty ~1 deg.]
- ★ Intensity: 30 Crab (2-30 keV) [Uncertainty: ~20%]¹⁶

Detection of GRB090831A(2)



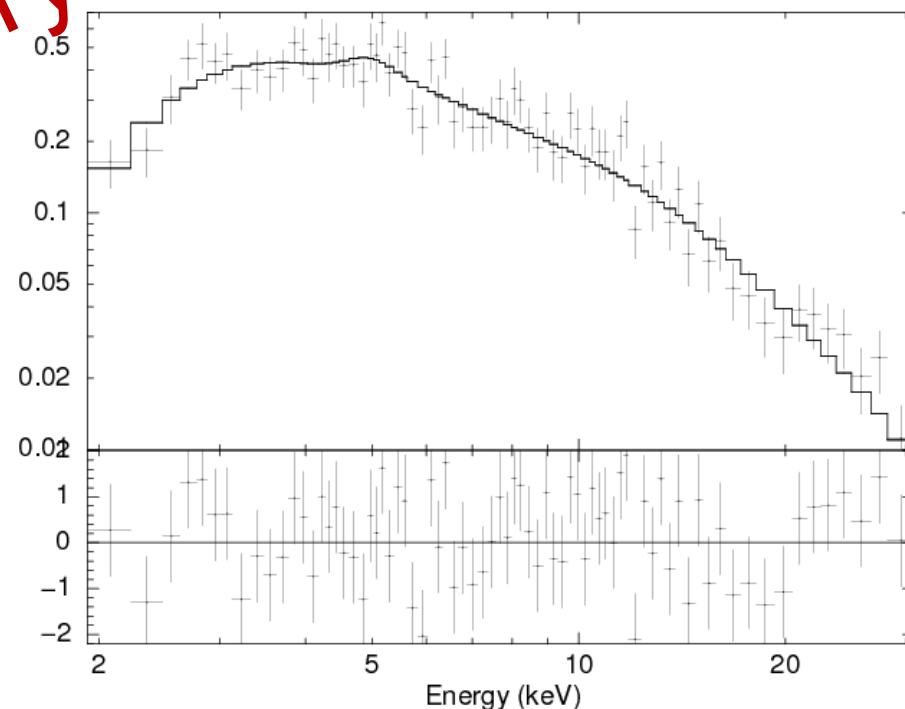
Nakajima,
Sigizaki,

DPTC {CAMERAID==2 && RA>130 && RA<160 && DEC>35 && DEC<65}



Preliminary!

data and folded model



★ Starting time: 7^h36^m35^s 31 Aug. 2009

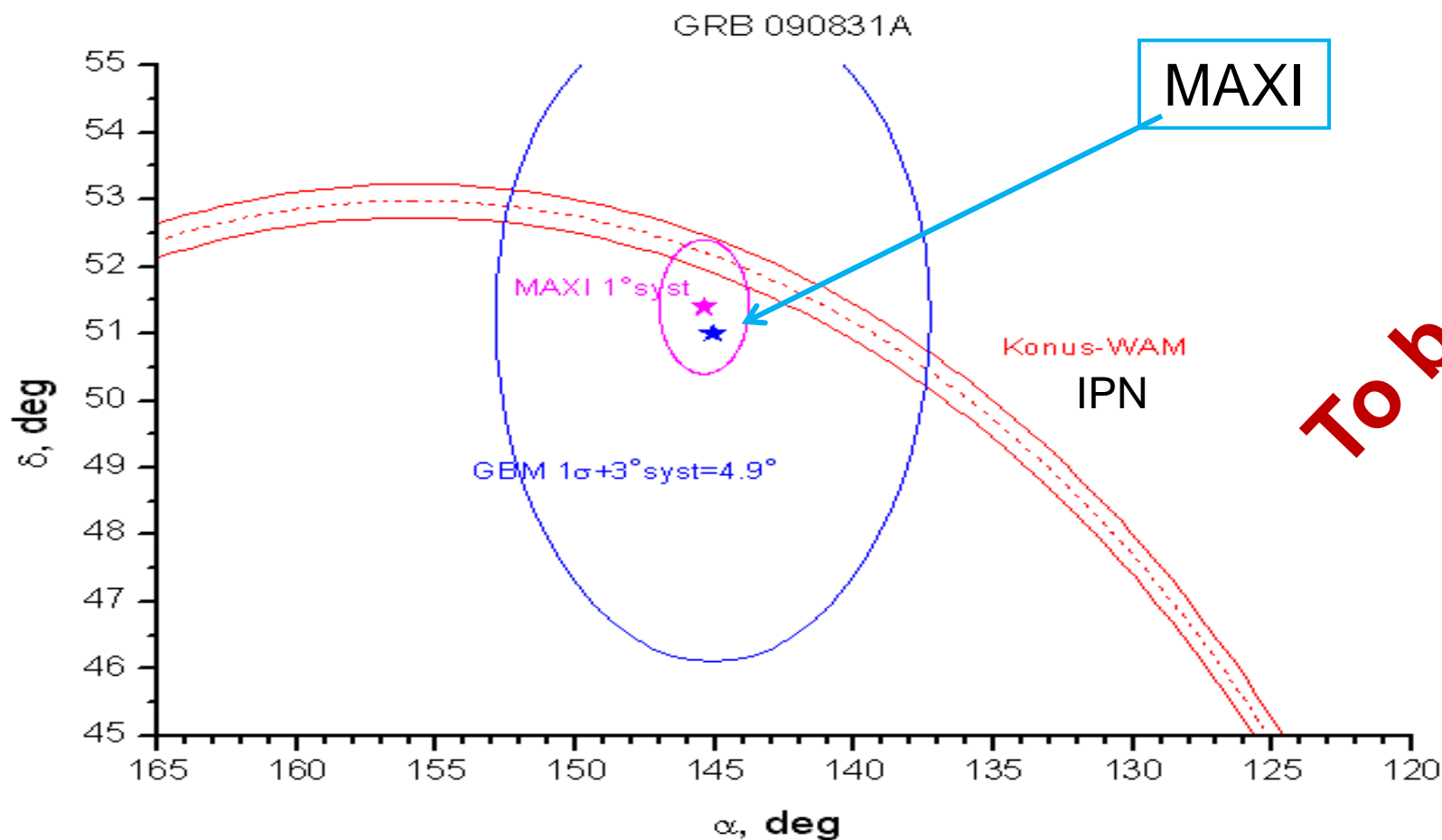
★ Flux ~ 8×10^{-8} ergs/cm²/s (2-30 keV)
★ Power index ~ 1.2?, $N_H \sim 10^{22}$ H/cm²?



Location of GRB090831A



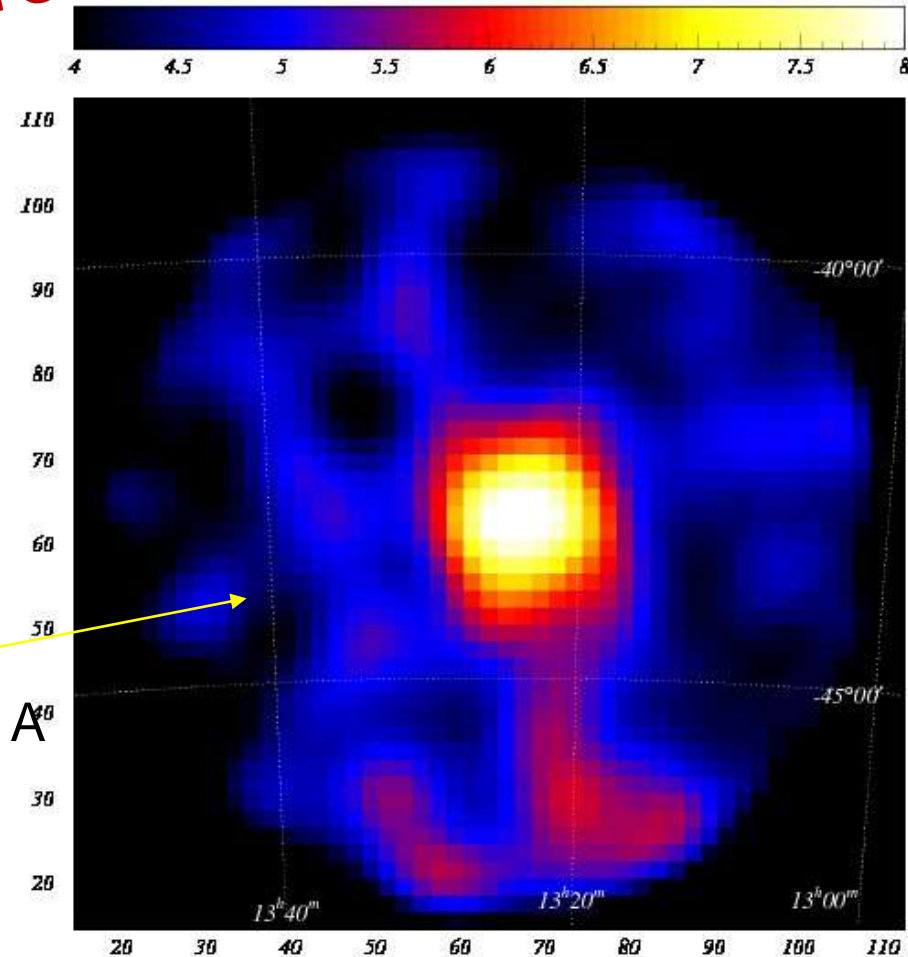
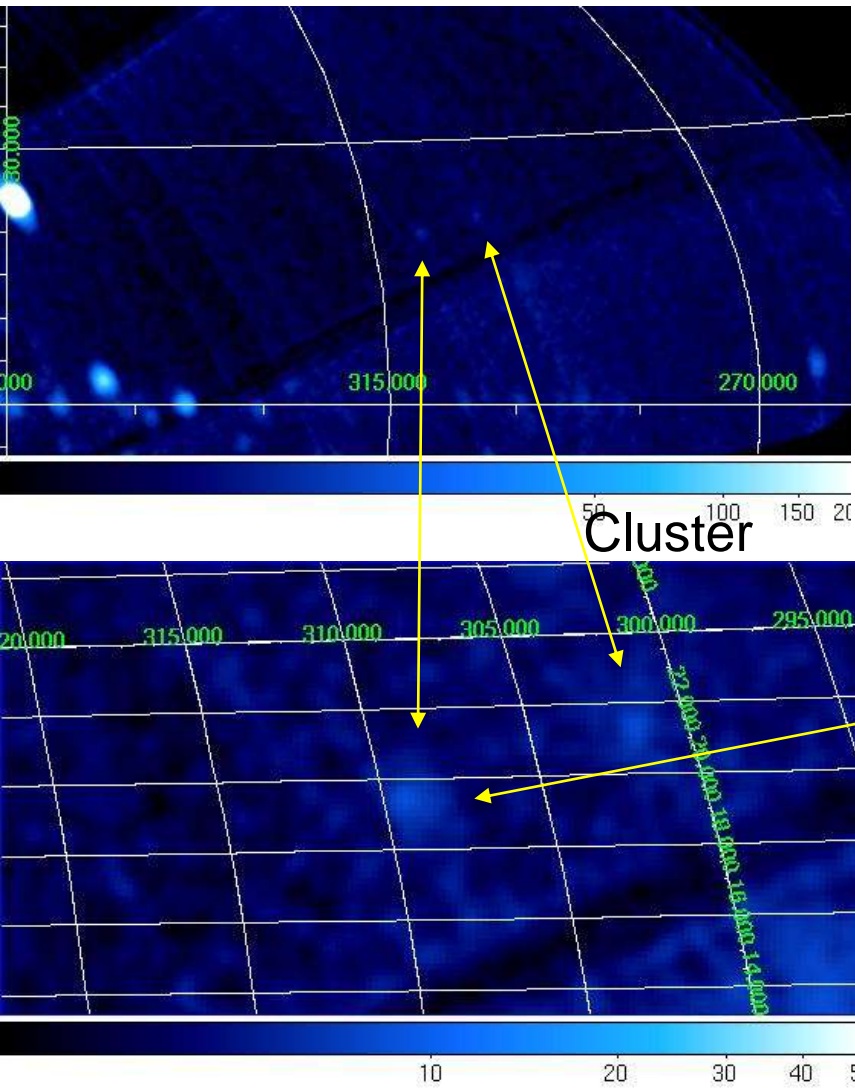
GCN 9864



To be revised!

Cen A and Cen Cluster of galaxies

Preliminary!



7 σ !



Future Prospect

- Nova Alert System: Negoro and his colleagues. Alert will be issued from JAXA.
- Archival Data System will be opened from RIKEN web; <http://maxi.riken.jp/>
- X-ray Source Catalogues for Galactic and extra-galactic sources above $\sim m_{\text{Crab}}(?)$ every a certain time.
- Collaborations with satellites and ground observatories in multi-wavelength band.



Summary

- All MAXI instruments are working well .
- Observation condition and level adjustment of MAXI are currently going on.
- Background, intensity, spectrum, time, attitude, etc are future issues for details.
- Nova Alert and Archival data will be open from Dec. 2009.
- For further MAXI information, please see News in <http://maxi.riken.jp/>.

Congratulations on 70th Giorgio Palumbo

