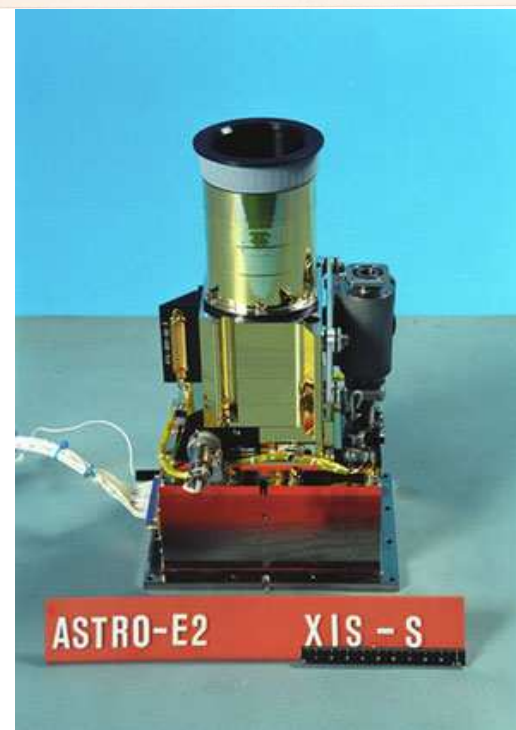
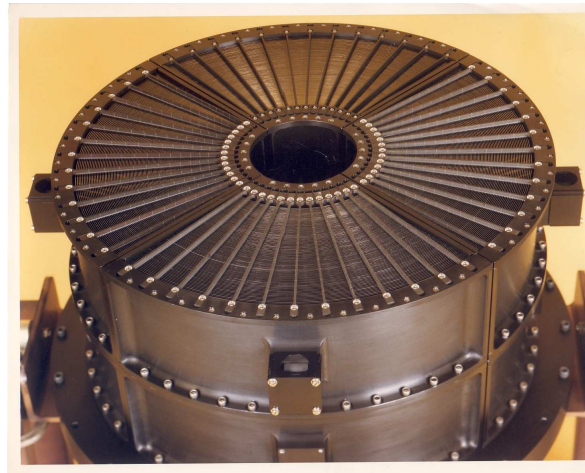
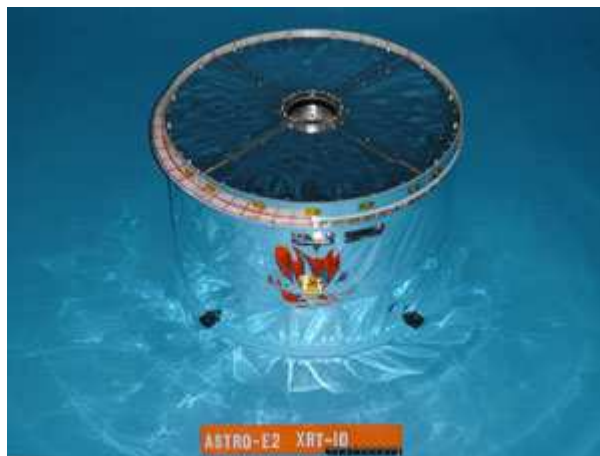




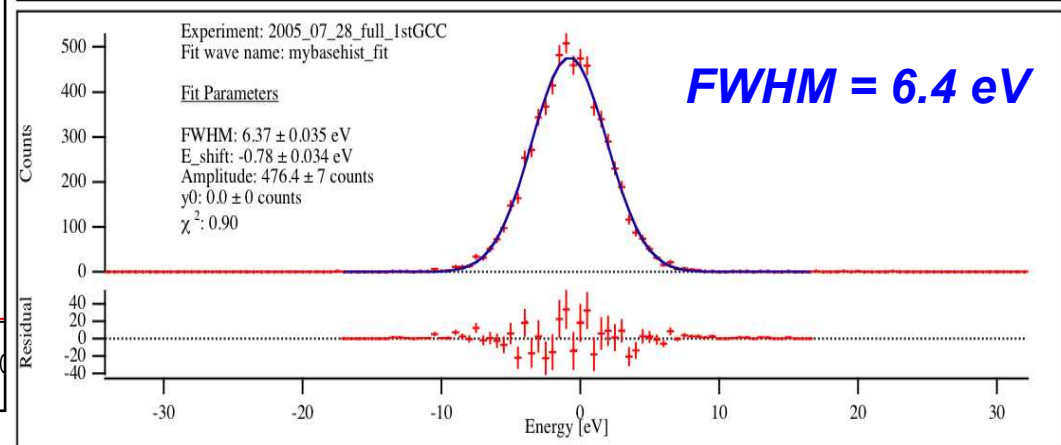
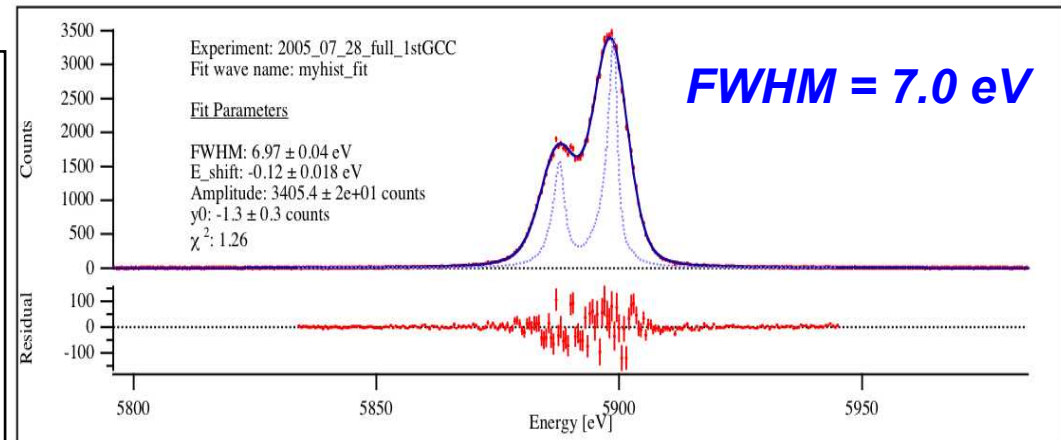
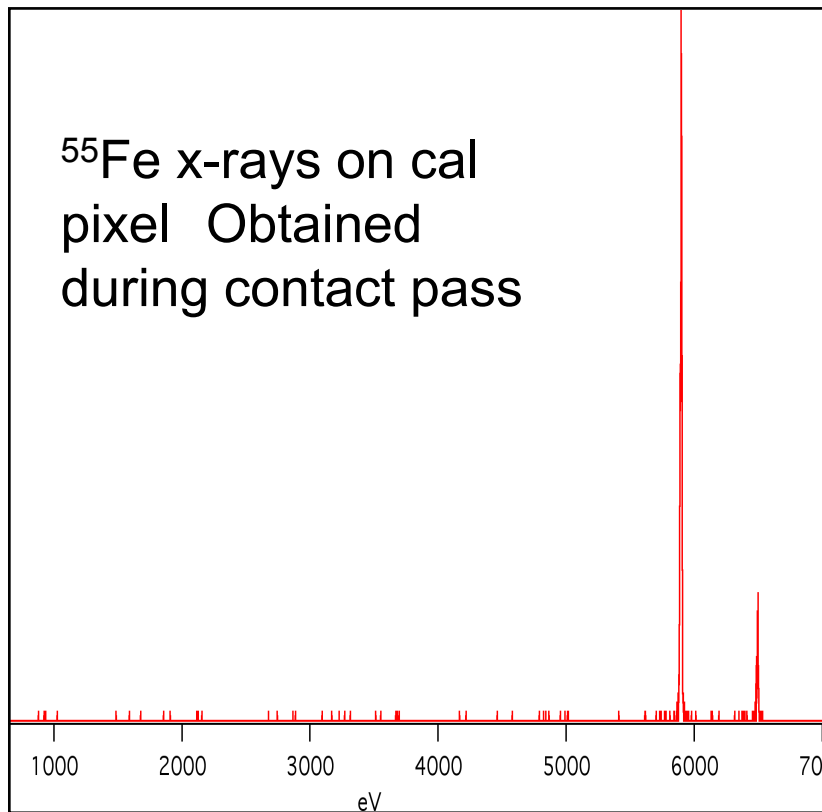
「すざく」衛星の3検出機器： HXD, XRS, XIS



First XRS Spectrum on Orbit !

- 60 mK , 7.0 eV @6.9 keV :World (Universe) Records
But !!

^{55}Fe x-rays on cal
pixel Obtained
during contact pass



宇宙最高エネルギー物理学

ASCA → Chandra/XMM → Suzaku の科学

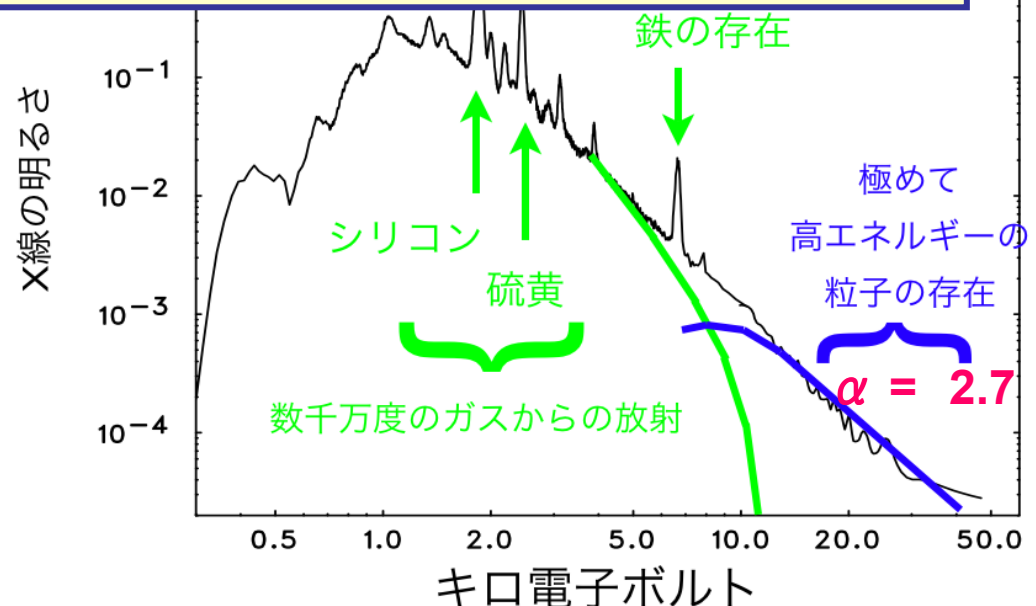
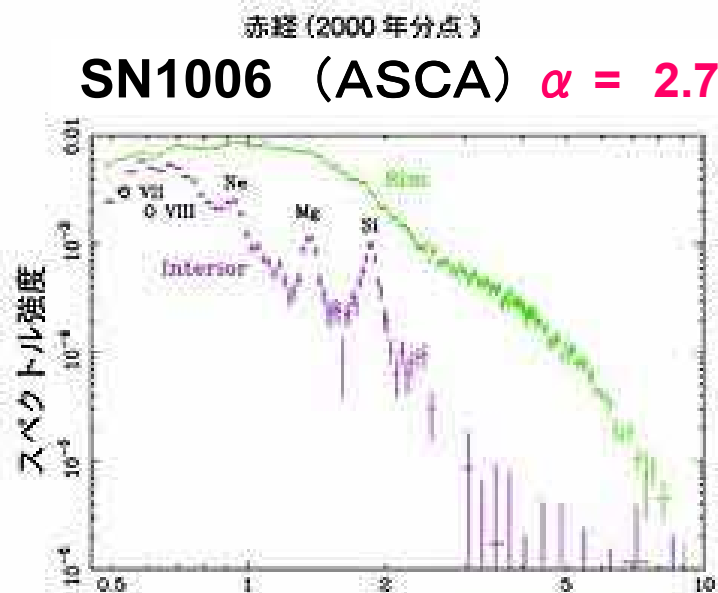
宇宙最高エネルギー加速器物理学

(1) 何処に作る(ある?)。どんな方法で(か?)

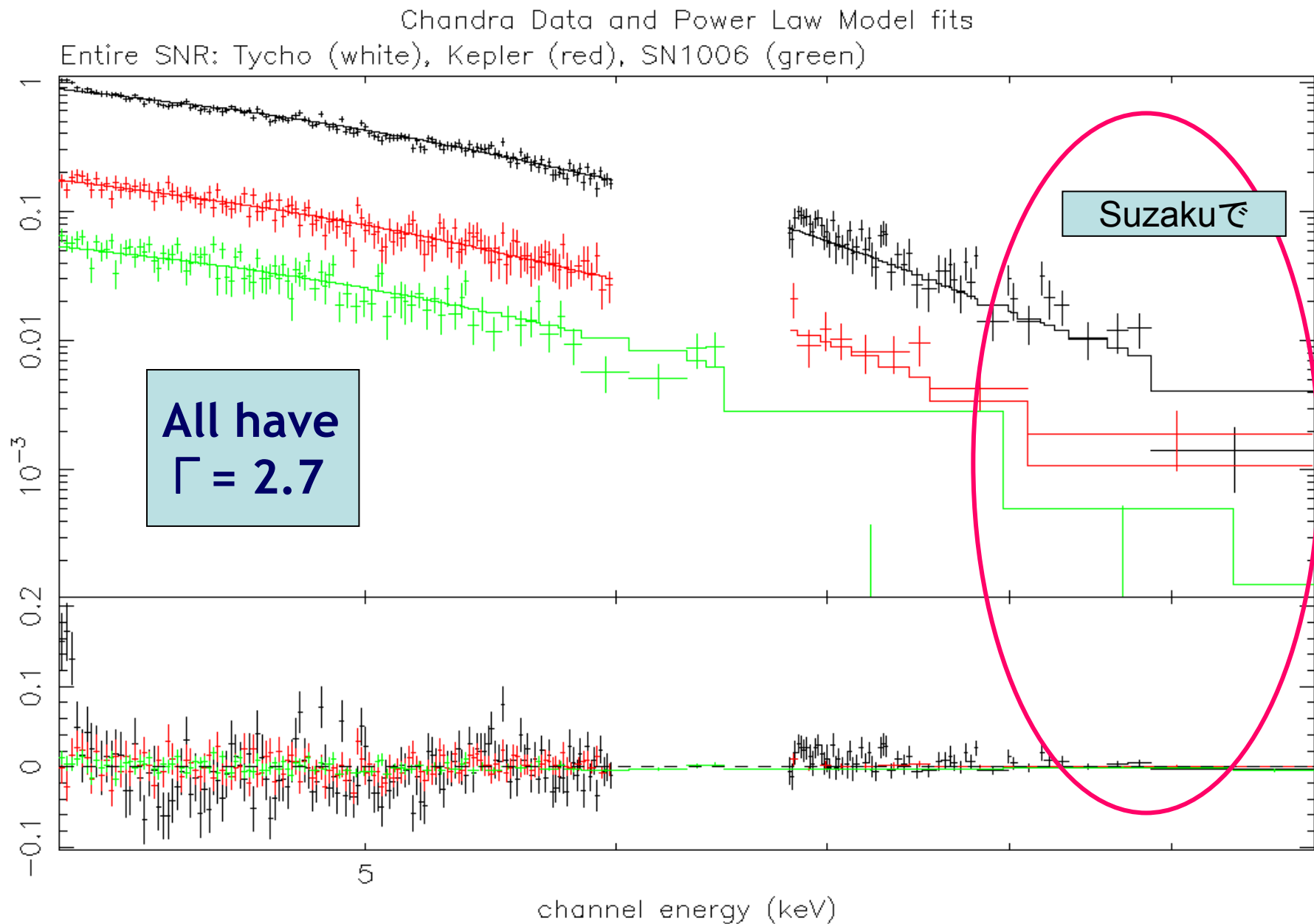
(2) 標的は

電子加速器 Photon (磁場=Synchrotron X、CMB=IC TeV)

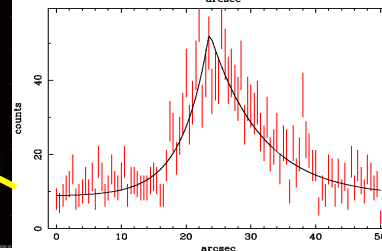
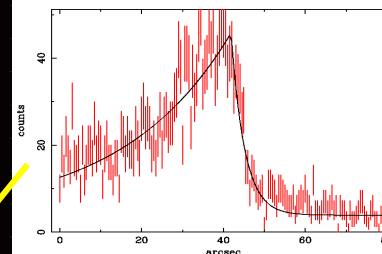
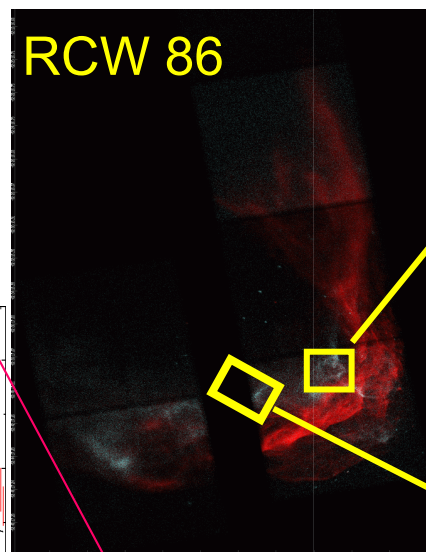
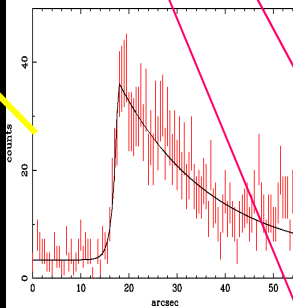
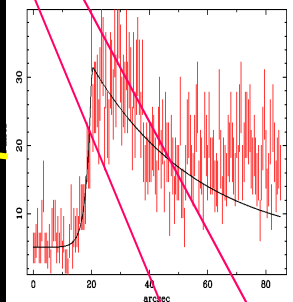
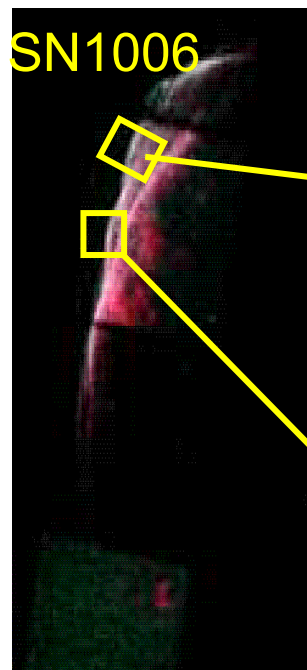
陽子加速器 Proton ($\pi^0 \rightarrow \gamma$)



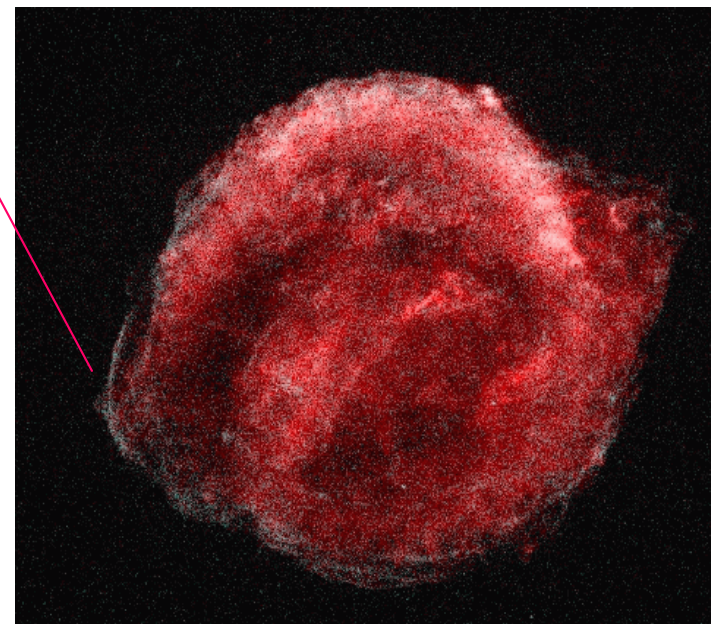
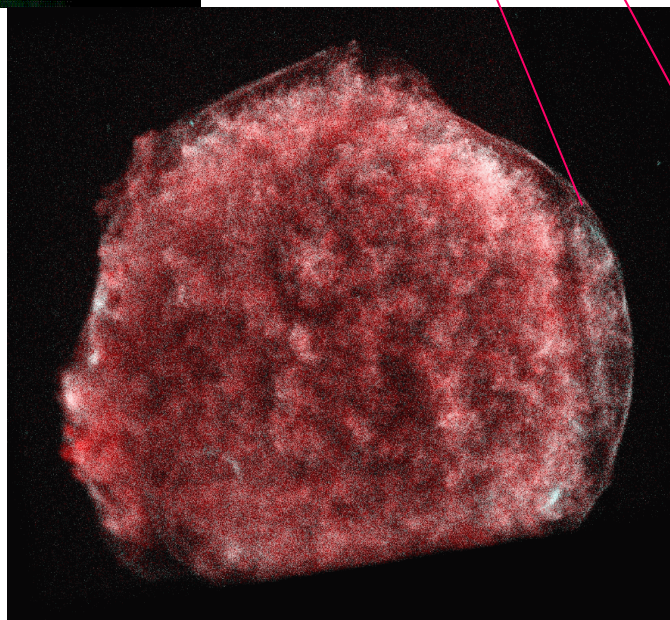
Bright/Young SNRs : Hard X-ray Tail



異様に細い Non-Thermal Filaments ($\alpha=2.7$)

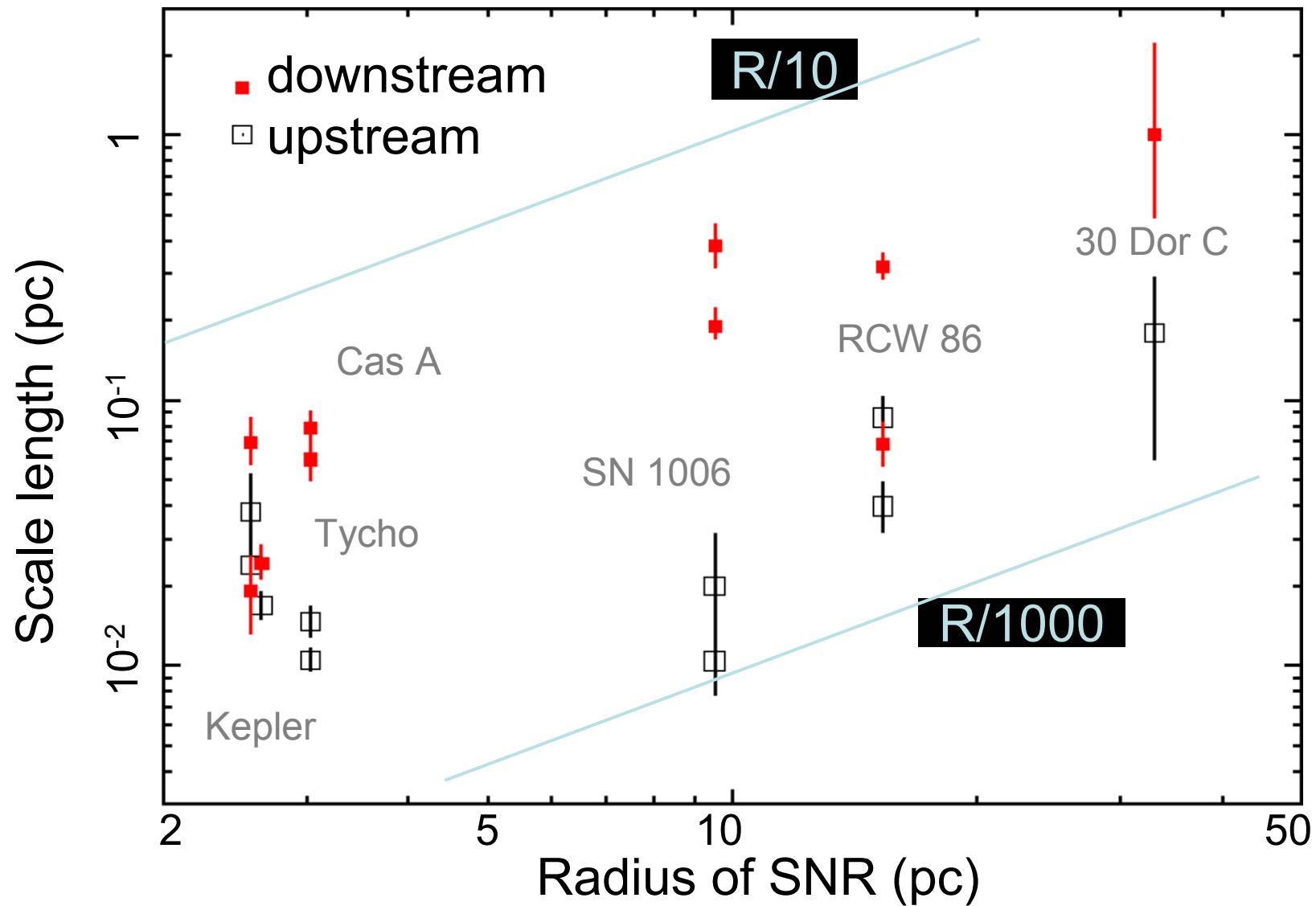


Tycho



Kepler

The scale length vs. radius



The scale length is ~ % of the radius.

Analysis of the SN1006 shell

$$\alpha = 2.7$$

Diffusive shock acceleration model with
nearly perpendicular
magnetic field.

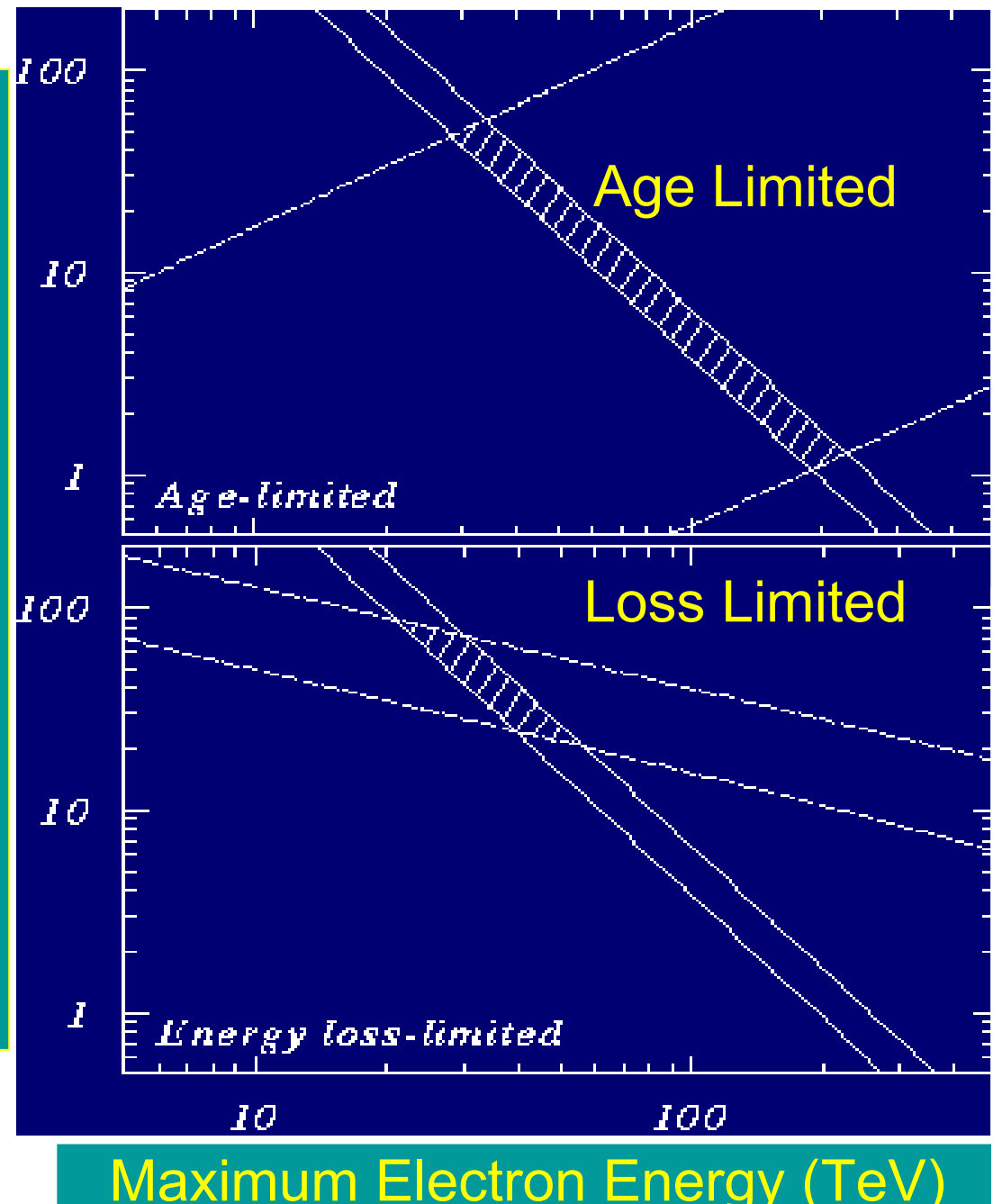
Age-limited

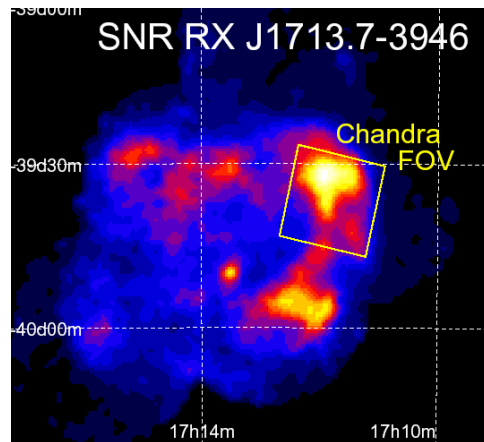
$E \sim 30\text{-}200$ TeV

Loss-limited

$E \sim 20\text{-}50$ TeV

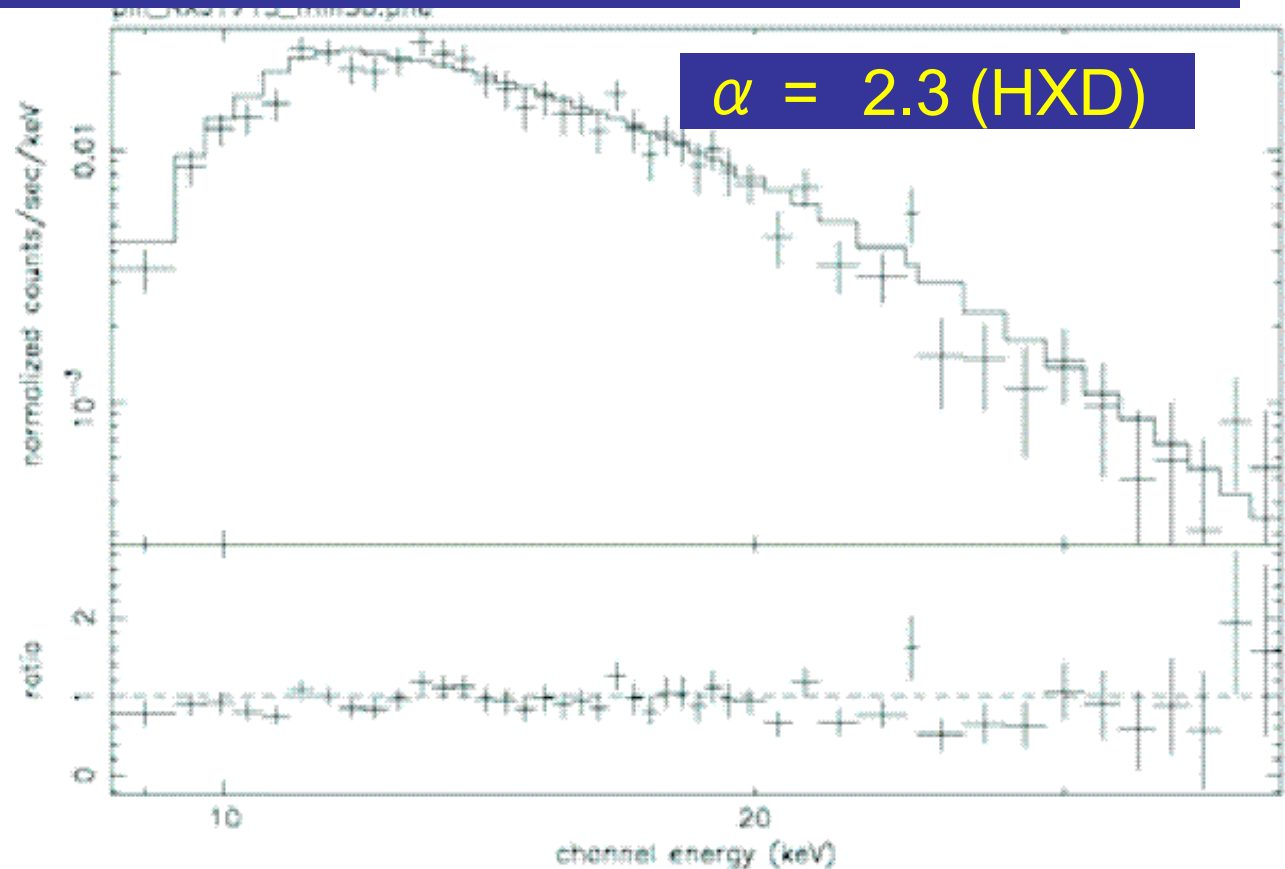
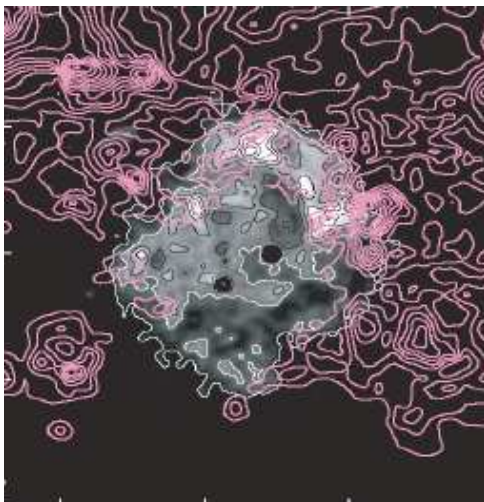
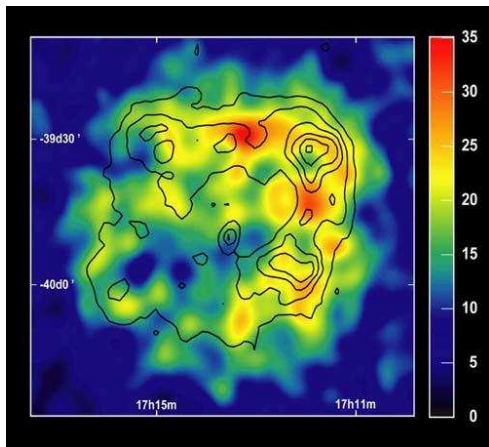
Magnetic Field (microG)



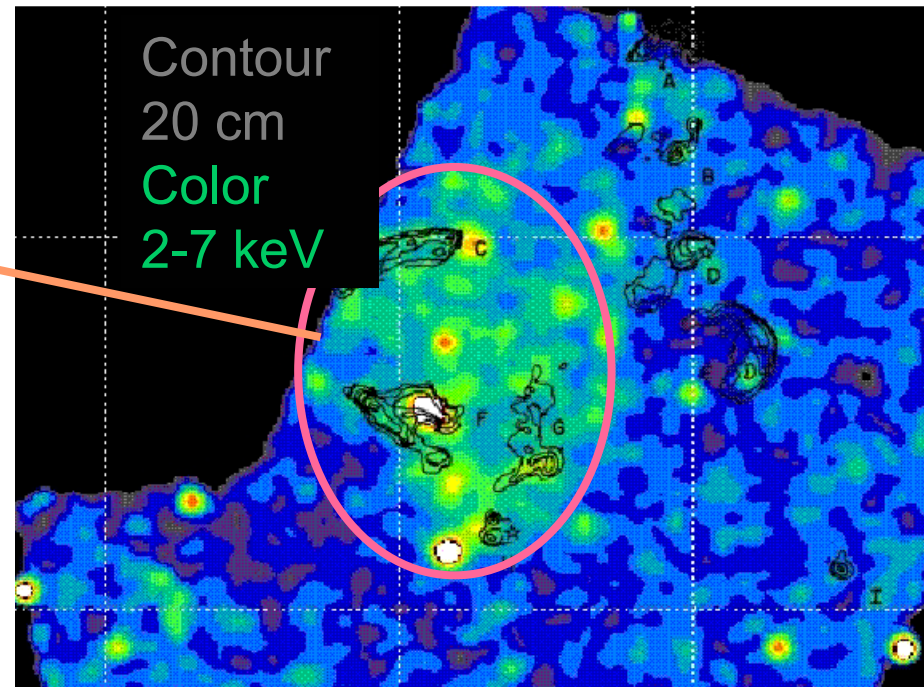


Proton Acceleration and/or Much Higher Energy

RXJ1713 is the only shell-type SNR which INTEGRAL has found some indication of hard X-ray emission.



Chandra G28.6-0.1



$$\alpha = 2.1$$

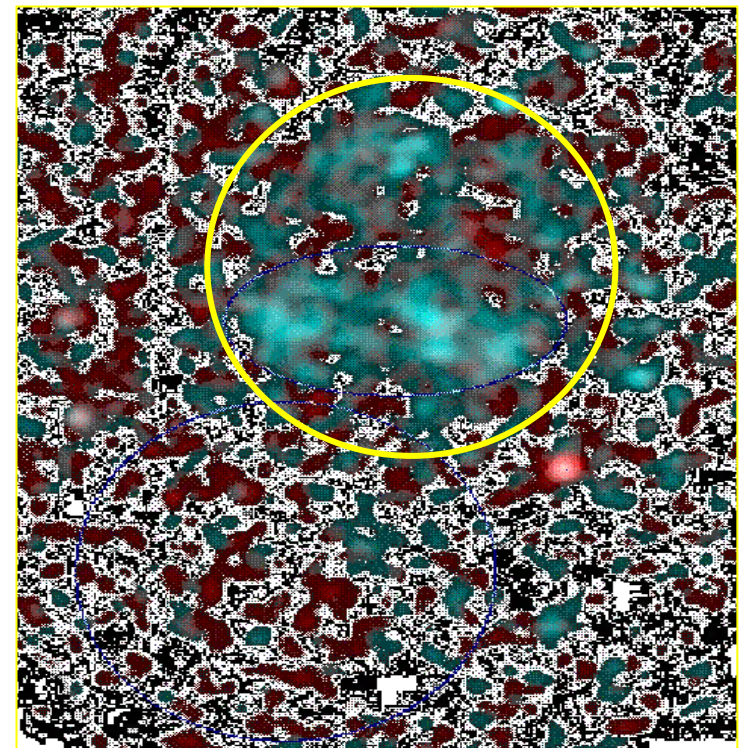
XMM-Newton G32.45+0.1

$$\alpha = 1.7$$

共にFlatなスペクトル
電子： < 10-100 TeV
あるいは、陽子？

Red
0.5-2 keV

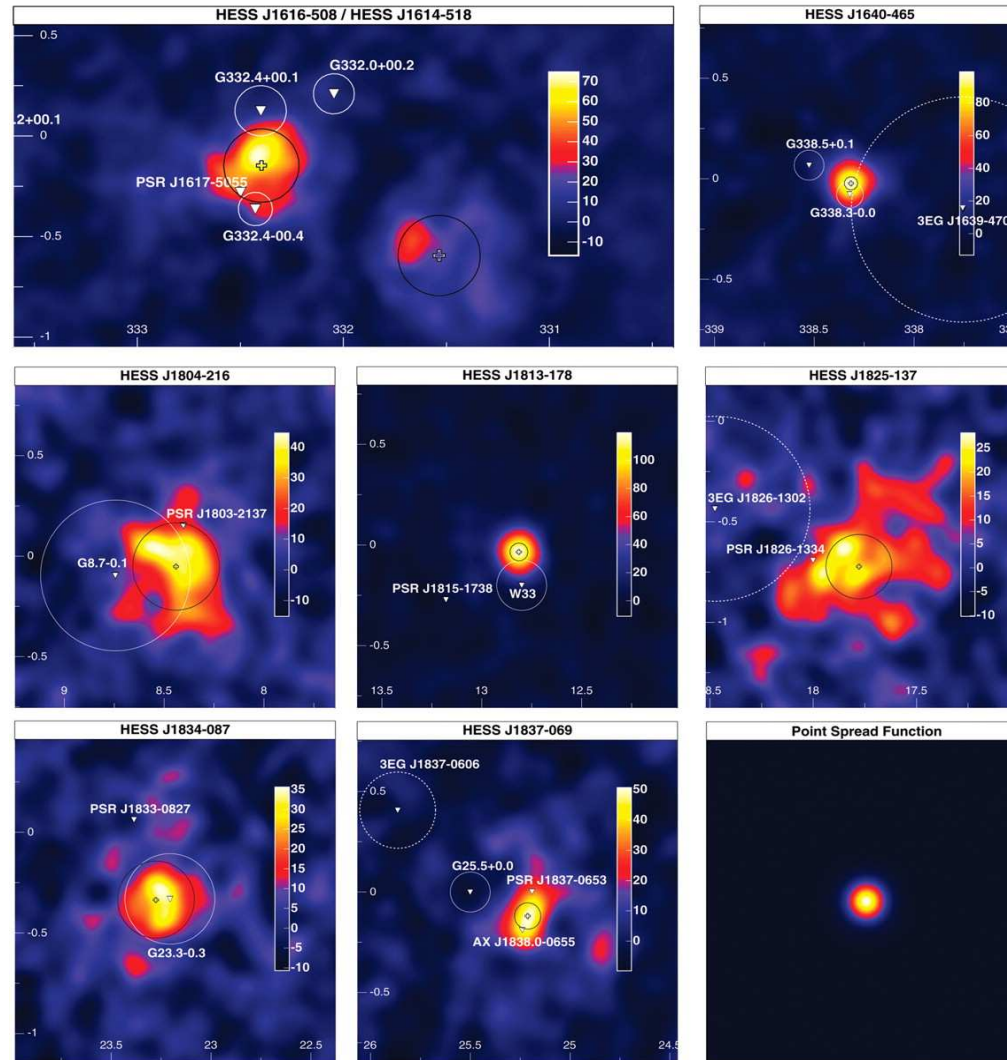
Blue
2-7 keV



AX J1813-178=1.8
 AX J1826-13 = 2.4
 AX J1838-065 = 1.5
 G347.5-0.3 = 2.3



100 TeV 以上の電子
 (Synchrotron)
 or
 陽子加速 ($p \rightarrow \pi, \gamma$)



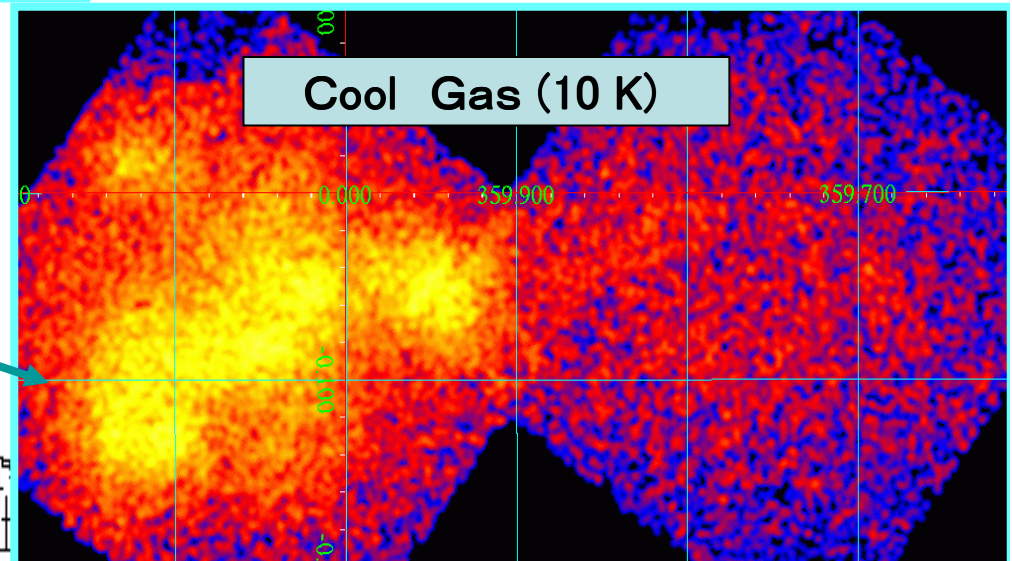
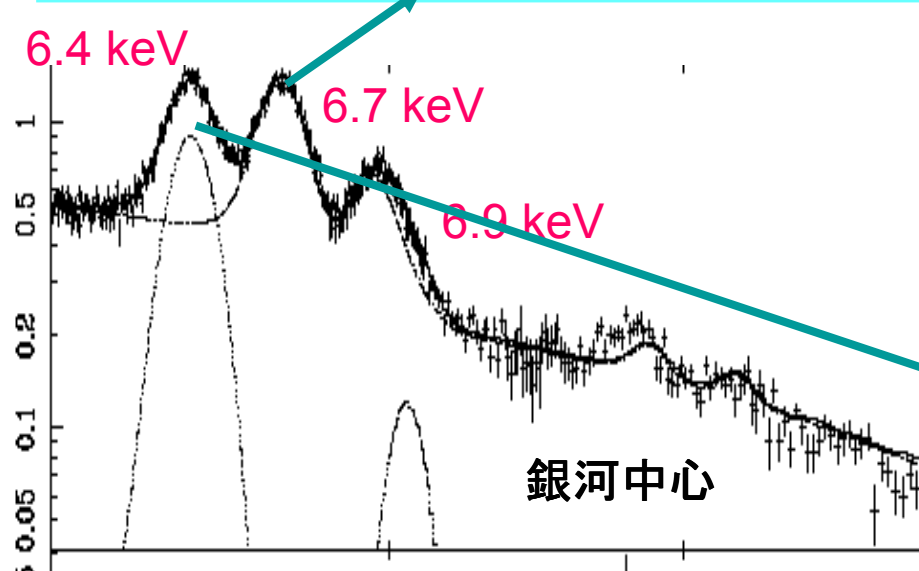
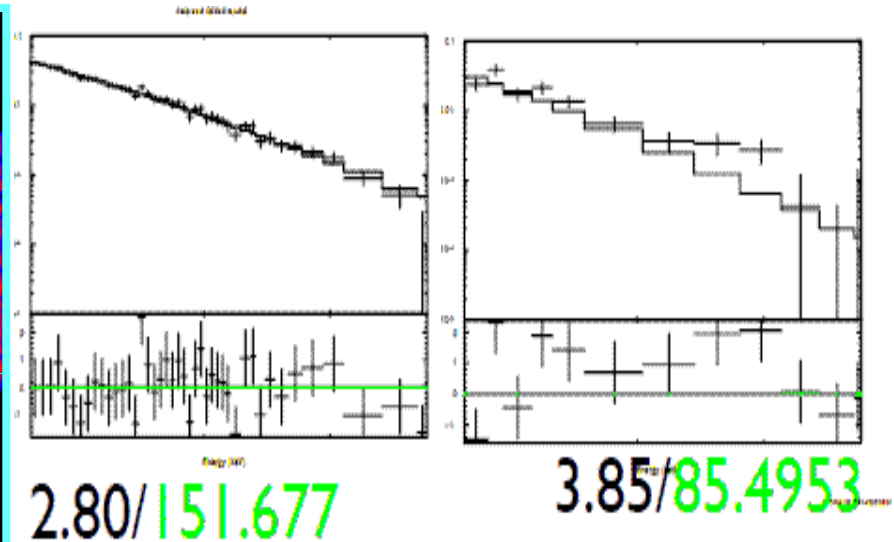
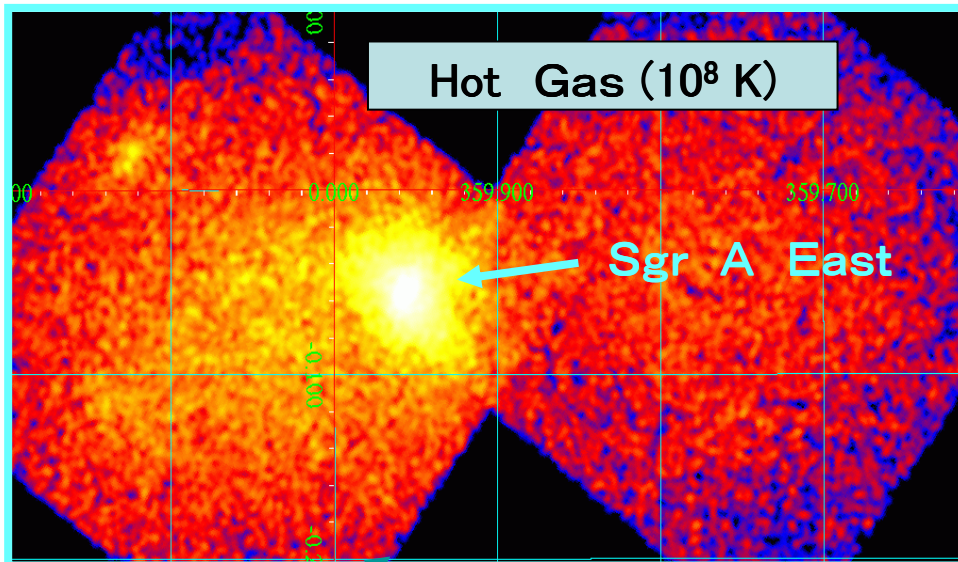
宇宙最高エネルギー粒子の起源と加速機構 → 宇宙線発見依頼
 の最大の謎。

その最近傍の実験室 → 銀河中心 対消滅線、GeV、TeVガン
 マ線、特異なX線

10-keV Plasma & Cool Gas + Reflection

Origin of the 10 keV Plasma ? Big bang of the BH or Multi-SNe ?

Origin of the 6.4 keV-line ? X-ray reflection by the Near-Past Bang of the BH



Origin of the Non Thermal Emission ? Cosmic Ray Acceleration

Non Thermal X-ray
Jets and filaments

巨大ブラックホール

$\alpha = 1.5$

