

In-orbit Background Study of GRM/SVOM

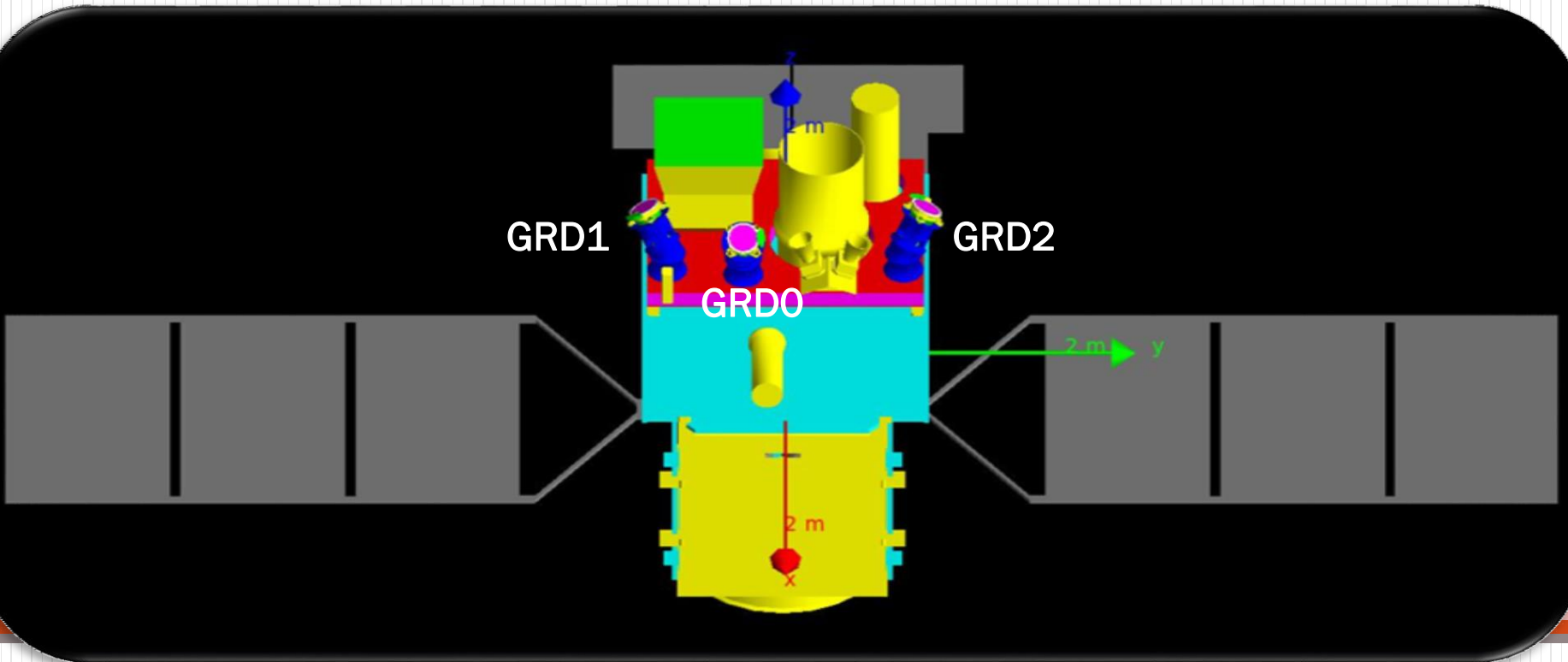
He Jiang

Institute of High Energy Physics

Chinese Academy of Sciences

2019.10.16

SVOM Mass Model



Orbit Altitude: ~ 600 km
Inclination Angle: $\sim 30^\circ$
Direction : Anti-Sun pointing

Each GRD has a 30 degrees angle to the +z-axis.
In the x-y plane, the angle between detectors is 120 degrees.
Energy Range: 0.015MeV-5MeV

The Background Source

- **Cosmic X-ray BK (CXB)**
- **Albedo Gamma**
- **Albedo Neutron**
- **Cosmic Ray Proton**
- **Electrons and Positrons**
- **SAA Trapped Particles**
- ...

➤ CXB

- **Isotropy(4π)**
- **Energy Spectrum:**

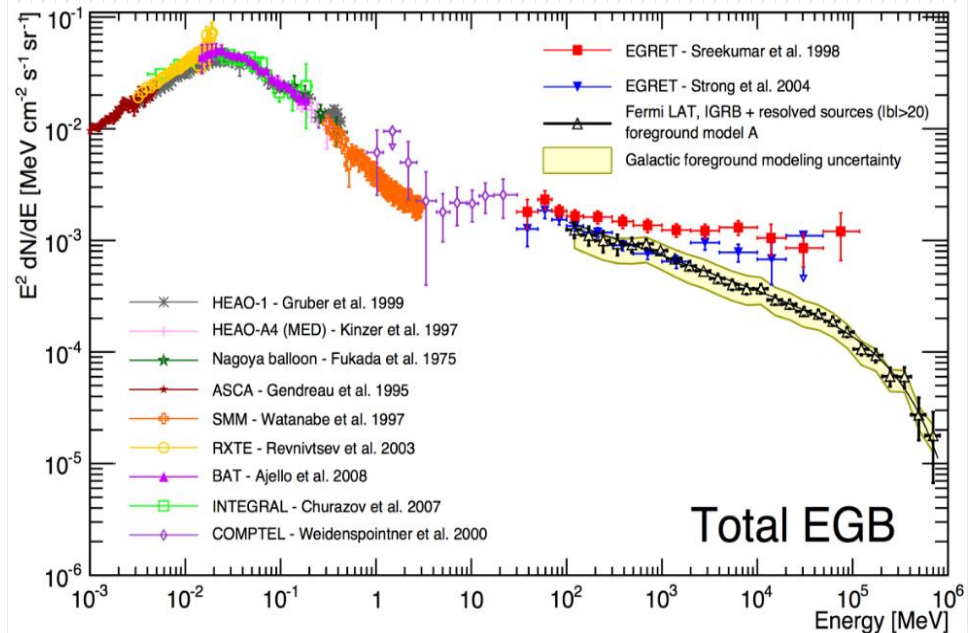
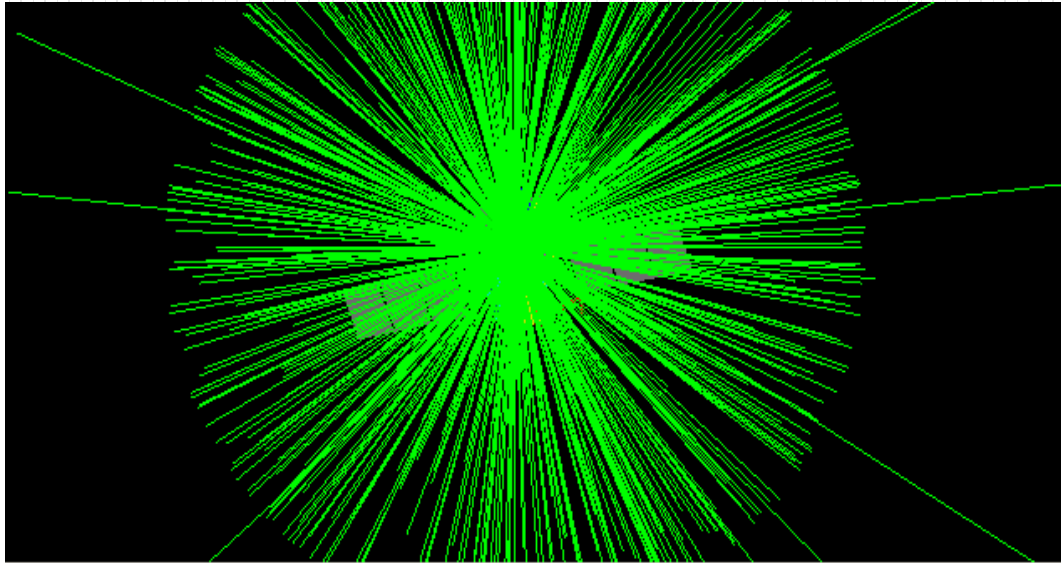


Fig 1 Energy Spectrum of CXB

$$\frac{dN(E)}{dE} = \begin{cases} 0.54E^{-1.4} & E < 0.02 \text{ MeV} \\ 0.0117E^{-2.38} & 0.02 < E < 0.1 \text{ MeV} \\ 0.014E^{-2.3} & E > 0.1 \text{ MeV} \end{cases}$$

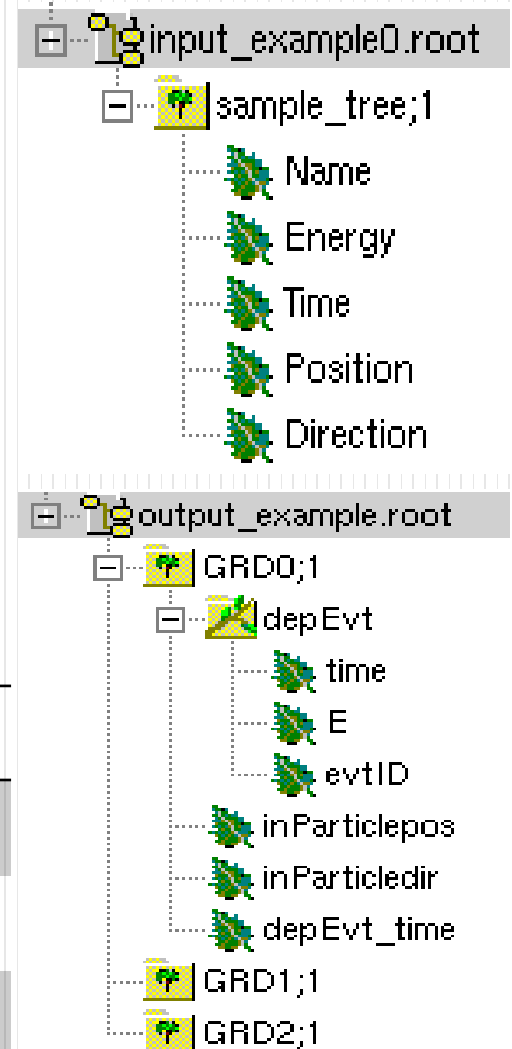
CXB

Number of Event:100000

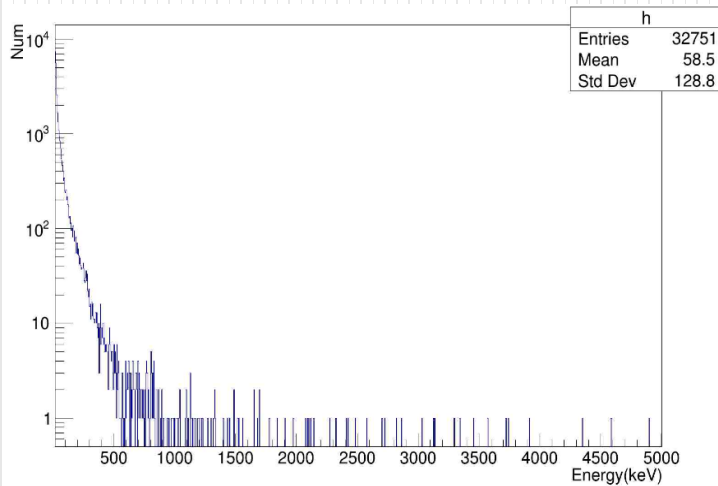


The position of GRD0 is the center

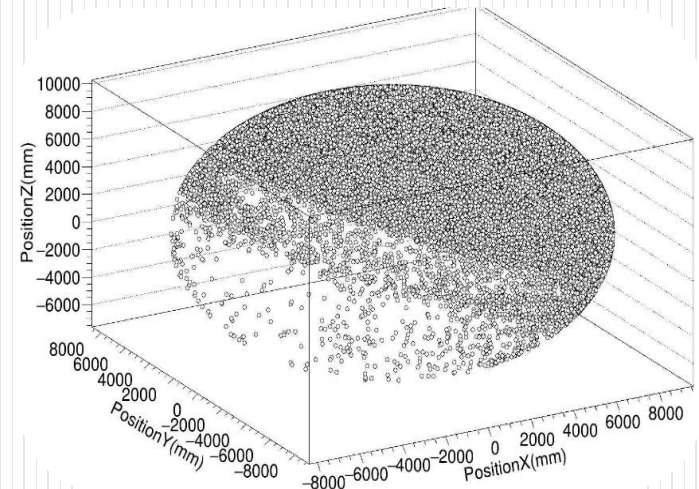
	x/mm	y/mm	z/mm
GRD0 NaI	585	-240.5	1301.15
GRD1 NaI	322.5	-801.074	1301.15
GRD2 NaI	322.5	800.074	1301.15



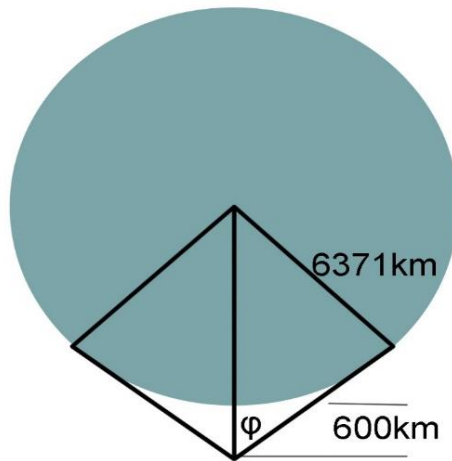
Events with deposited energy(GRD0)



Energy spectrum



Position distribution



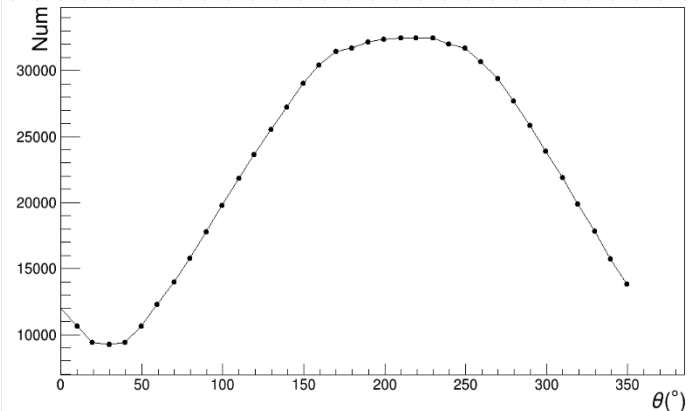
Earth Radius:

~6371 km

Orbit Altitude:

~600 km

$\varphi \approx 65.5^\circ$



The earth revolves around the y-axis, and the θ is the angle between +z-axis and the direction of earth.

Thank you!