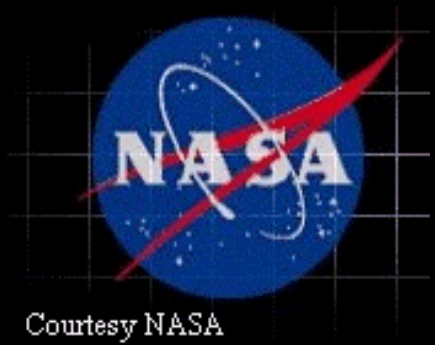
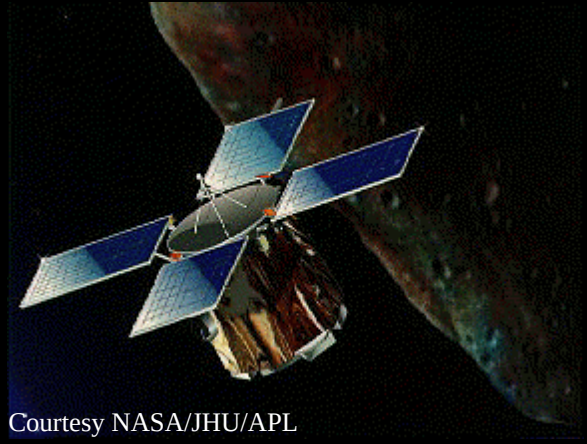


Courtesy NASA

NEAR: Near Earth Asteroid Rendezvous

Courtesy NASA/JHU/APL

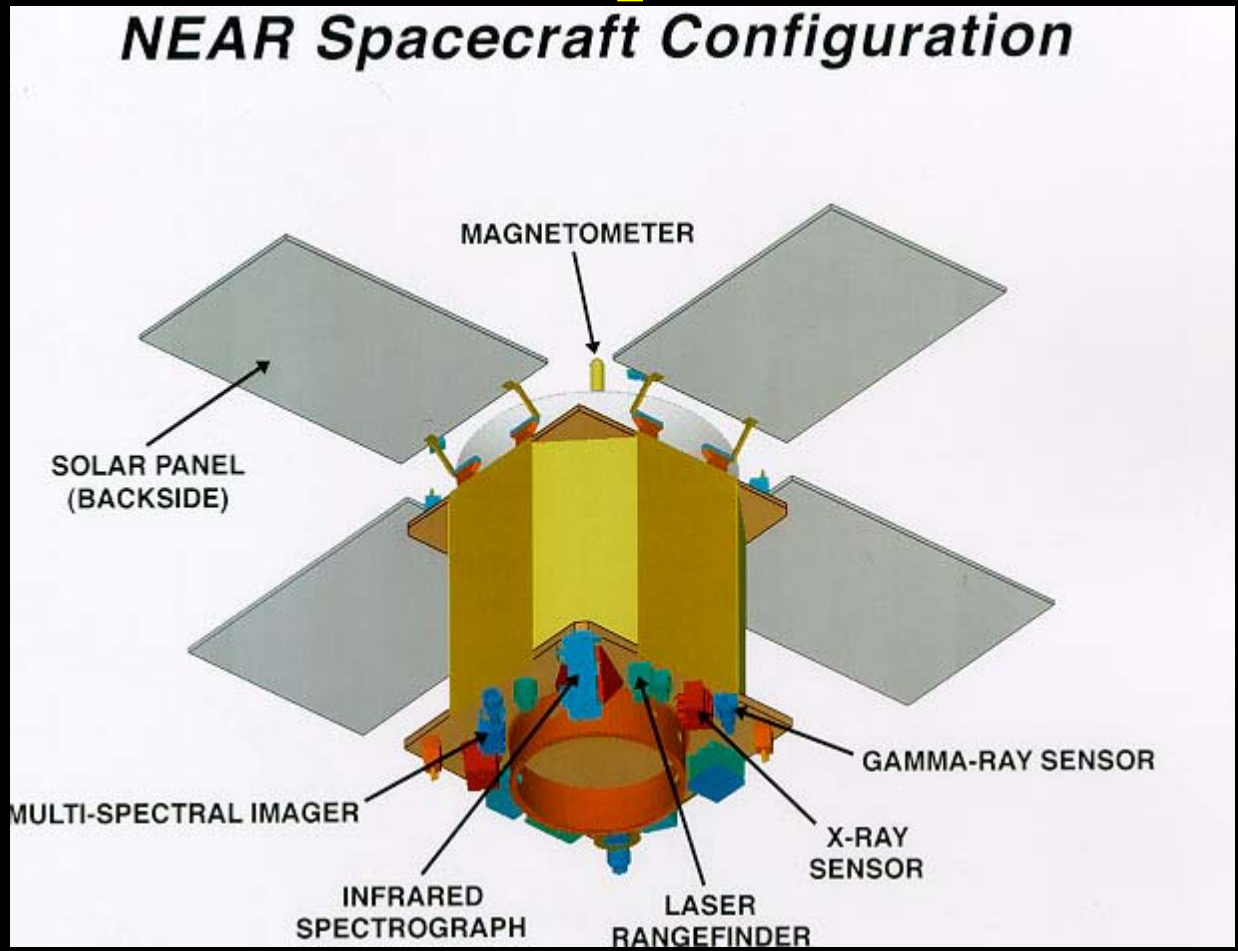
Gamma Ray Spectroscopy of Asteroid 433 Eros


Courtesy NASA/JHU/APL

NEAR Mission Objectives

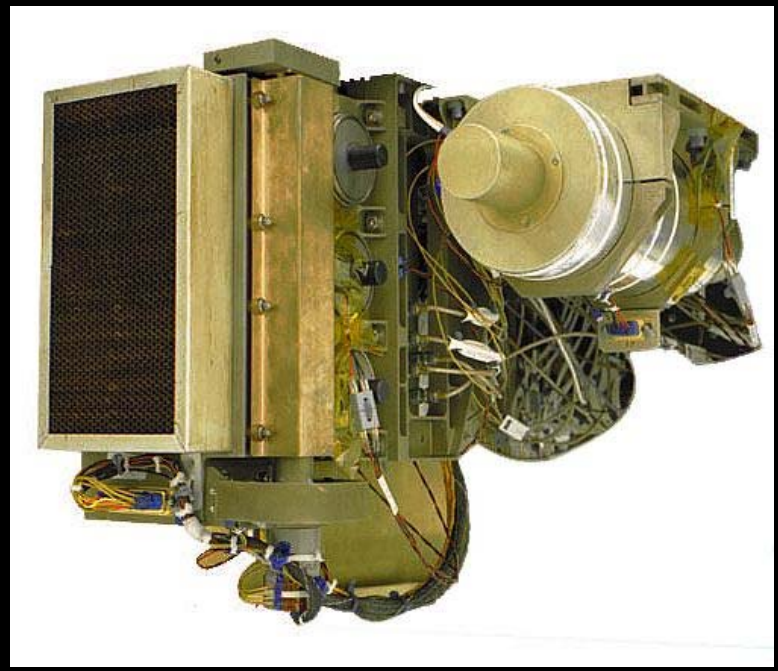
- First mission in NASA's Discovery Program
- Achieve stable orbit around asteroid 433 Eros
- Study asteroid for one year
- X-ray/Gamma ray Spectrometer
- Not designed or planned--Land and continue analysis from surface

NEAR Spacecraft



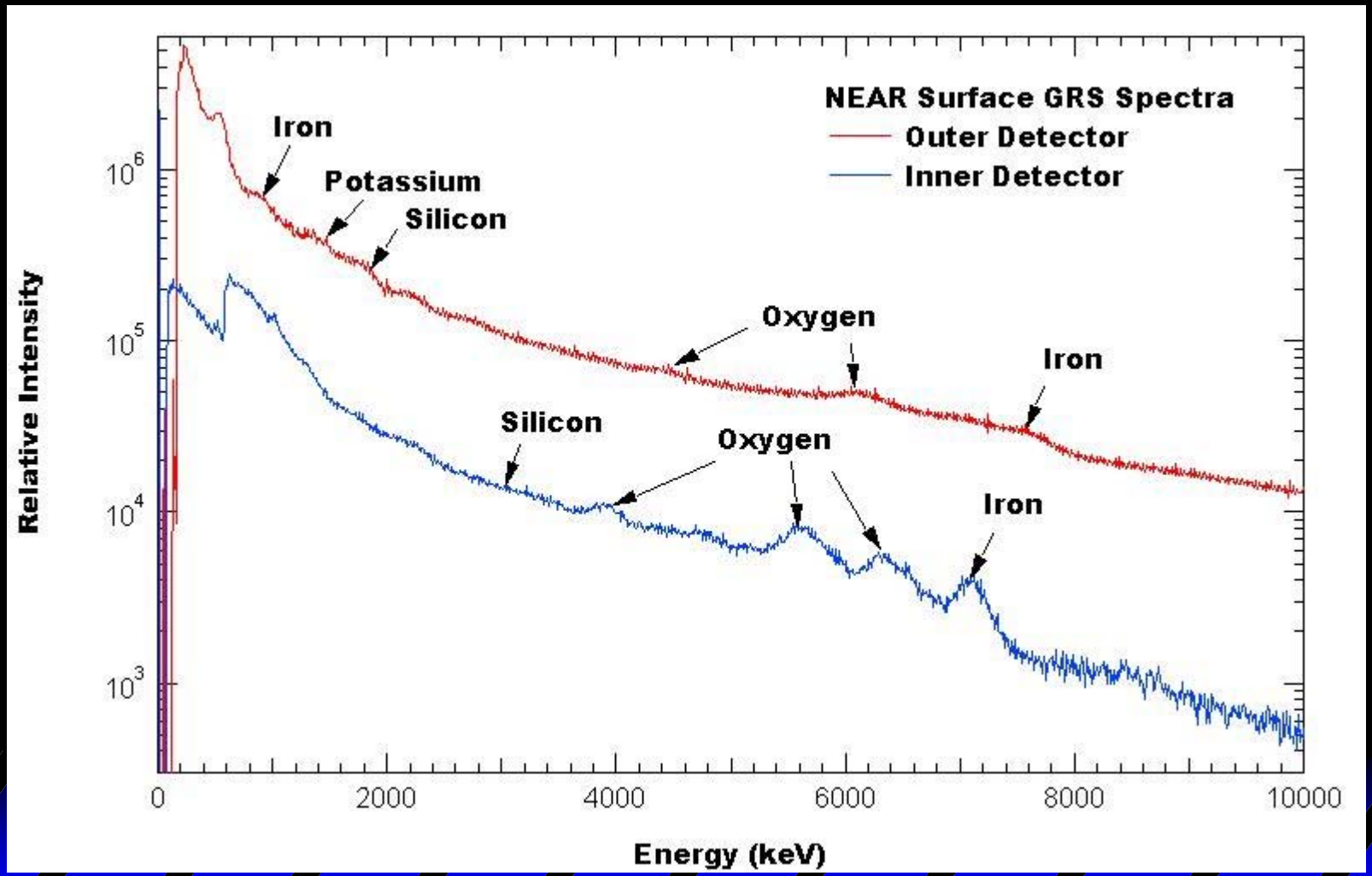
Courtesy NASA/JHU/APL

Gamma Ray Spectrometer



- Determine compostion of Eros
- Analysis of Gamma Ray Energies
- Two detector package
- Initial analysis revealed problem

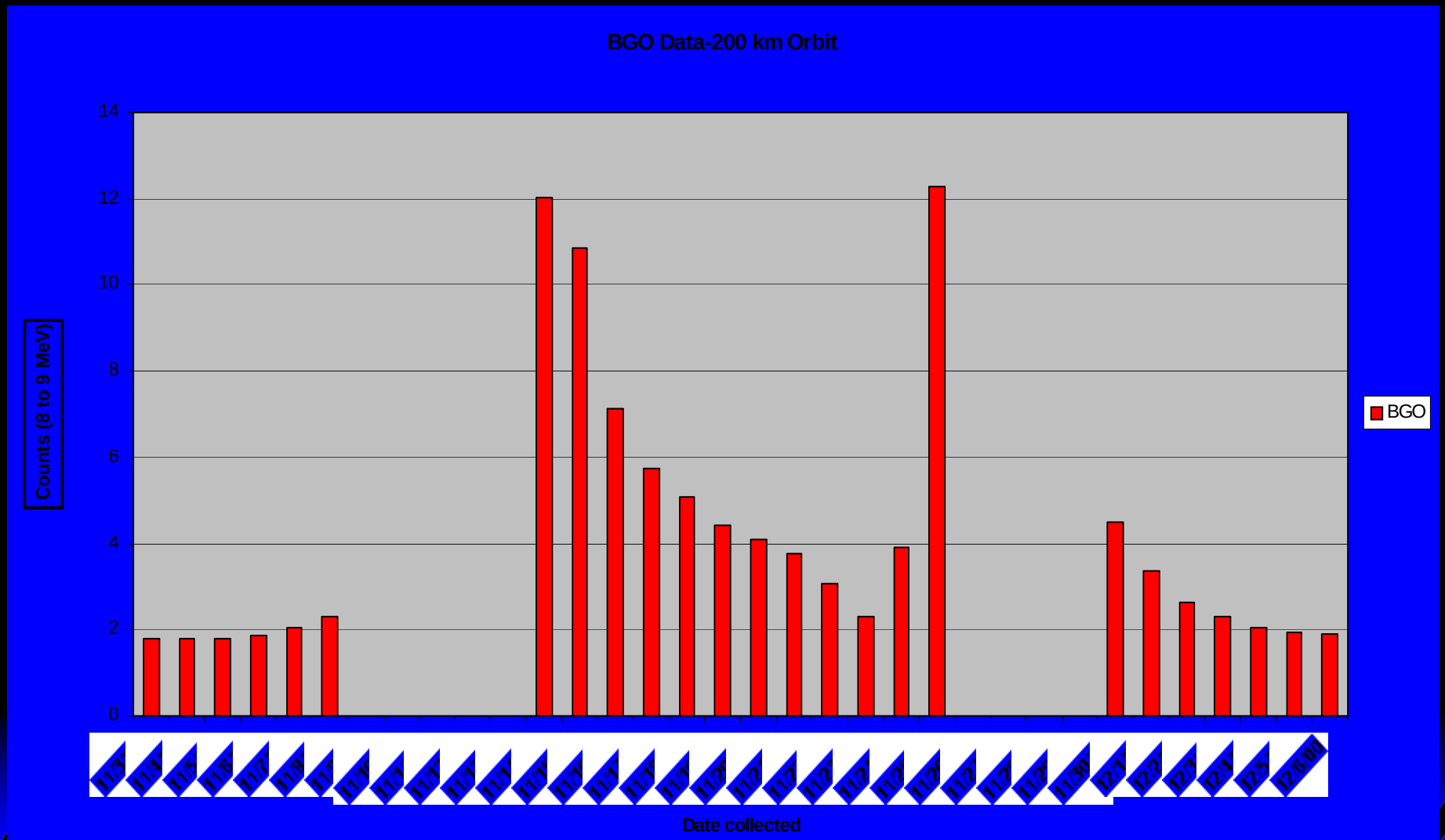
Surface Data (an excuse)



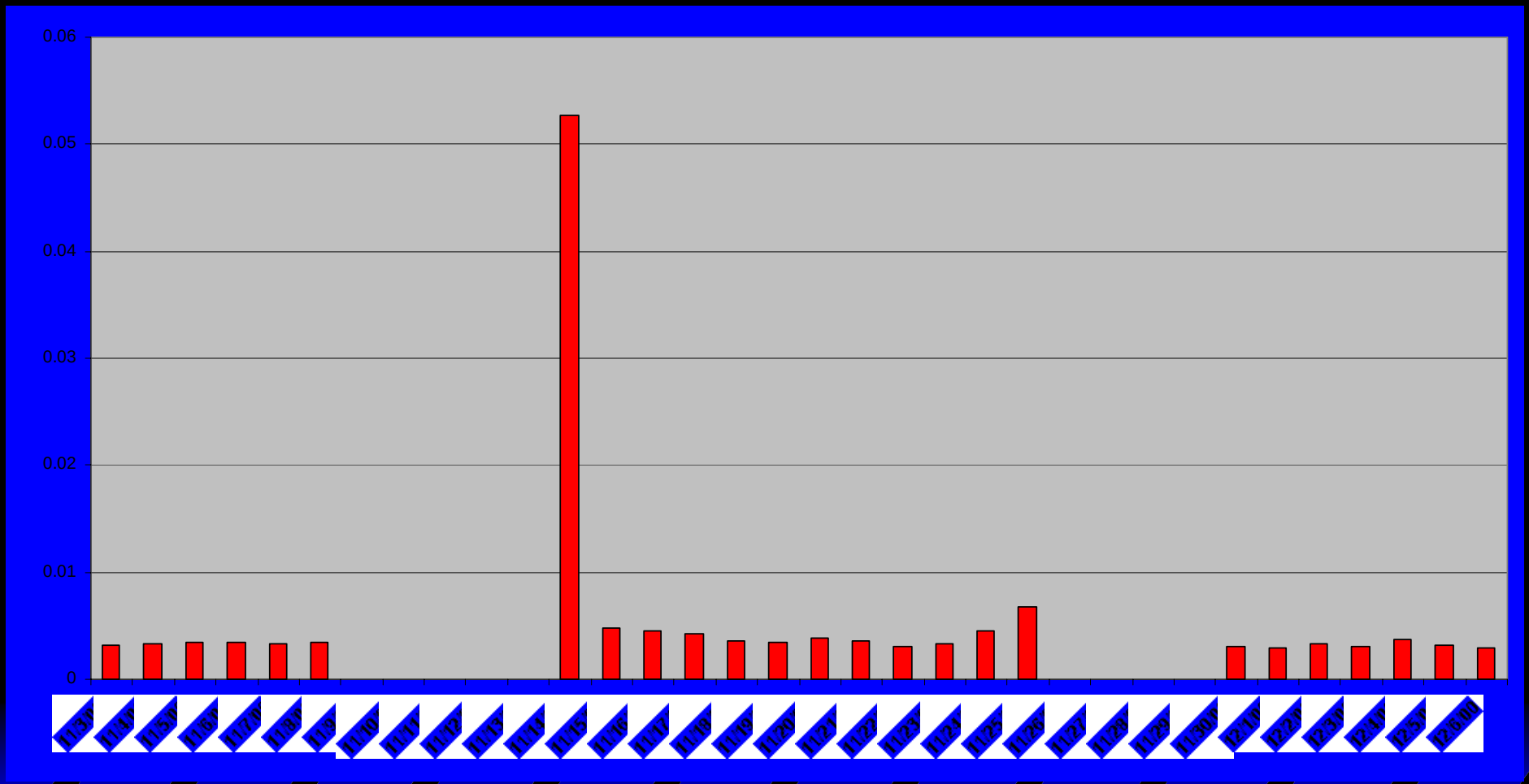
Problems & Solutions

- Cosmic Ray bursts
- Major solar events
- Analyze data day at a time
- Eliminate corrupted data

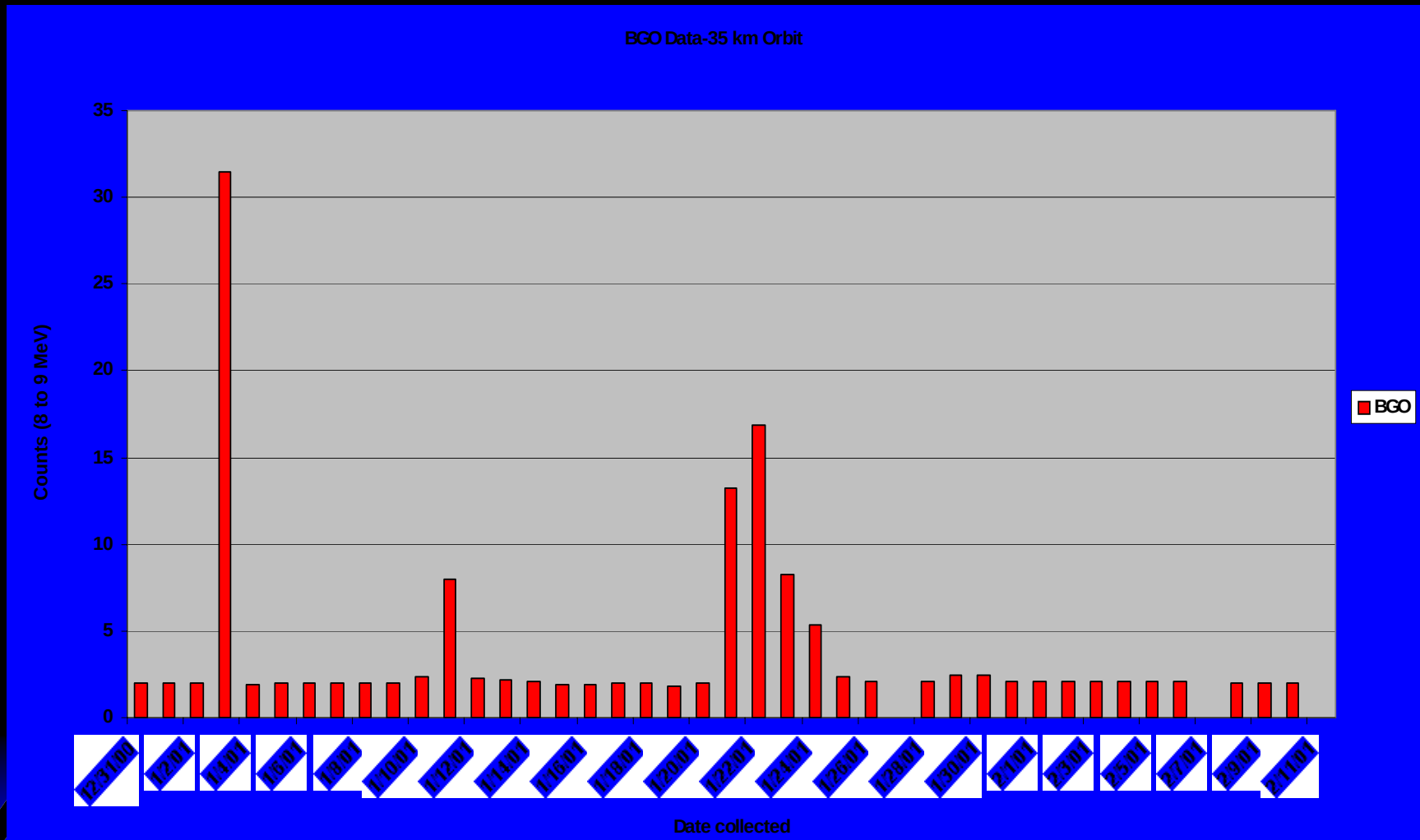
BGO Data


BGO Data-200 km Orbit
Counts (8 to 9 MeV)
14
12
10
8
6
4
2
0
BGO
r1.3
r1.4
r1.5
r1.6
r1.7
r1.9
r1.10
r1.11
r1.12
r1.13
r1.14
r1.15
r1.16
r1.17
r1.18
r1.19
r1.20
r1.21
r1.22
r1.23
r1.24
r1.25
r1.26
r1.27
r1.28
r1.29
r1.30
r2.1
r2.2
r2.3
r2.4
r2.5
r2.6 (d)
Date collected

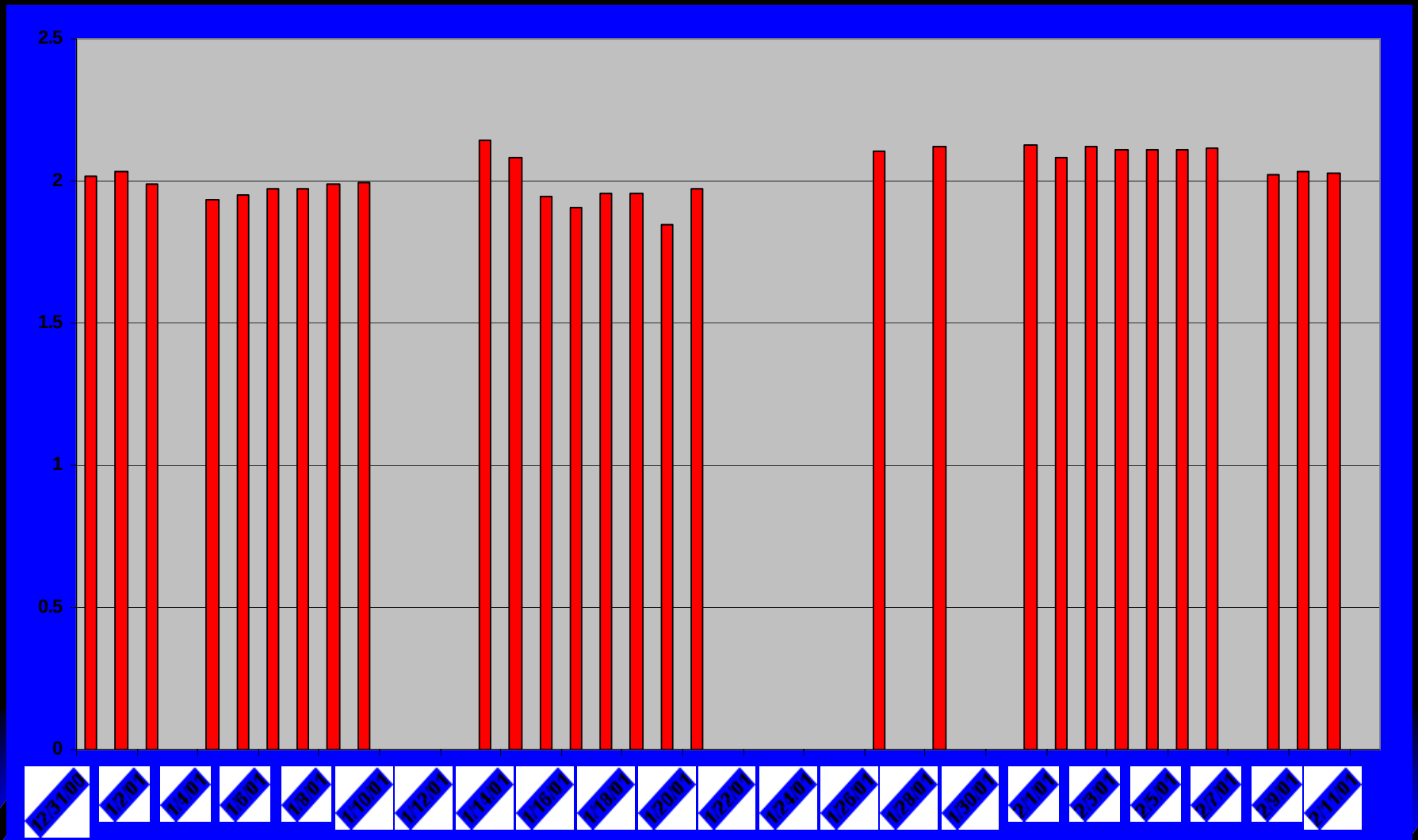
Anti-Coincidence



35 km Orbit


BGO Data-35 km Orbit
Counts (8 to 9 MeV)
35
30
25
20
15
10
5
0
BGO
12/31/00
1/2/01
1/4/01
1/6/01
1/8/01
1/10/01
1/12/01
1/14/01
1/16/01
1/18/01
1/20/01
1/22/01
1/24/01
1/26/01
1/28/01
1/30/01
2/1/01
2/3/01
2/5/01
2/7/01
2/9/01
2/11/01
Date collected

Clean 35 km Data



Determination of Composition

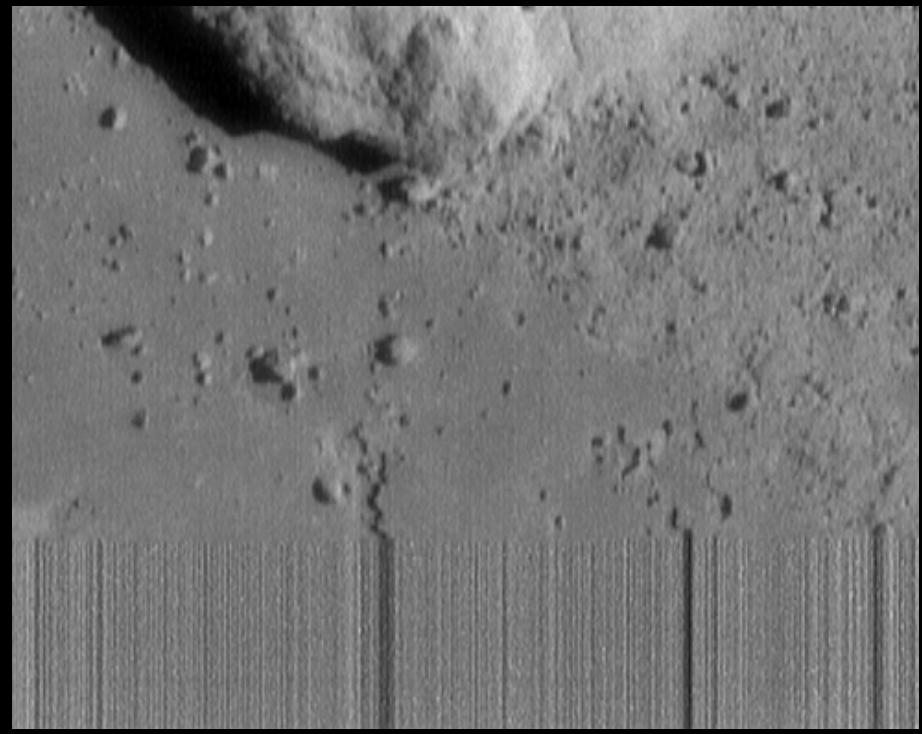
- Insert clean data
- Program computes elemental response functions
- Hopefully will agree with XRS or prove it wrong

Efficiency & Resolution

- Relate counts to photons
- Efficiency = # counts/# incident photons
- Power law fit to Resolution
- Theory states Slope = -.5
- Data puts Slope = -.47
- Possible light pipe effect

Orbit Images

Descent Image



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