

GRBs & Solar Flares

Science Working Group



GLAST-LAT GRB trigger

Spatial Likelihood

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Outline

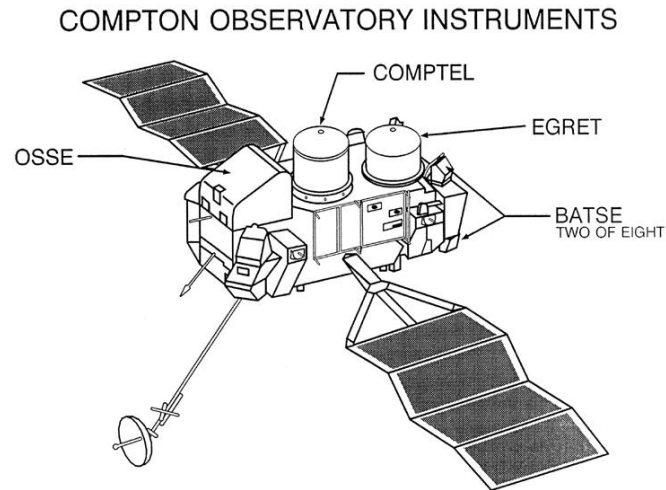


- GRB trigger (HE satellites)
 - CGRO
 - BeppoSAX
 - INTEGRAL
 - AGILE
- Purpose of Spatial Likelihood
- Energy Likelihood
- Other strategies: ACD, Silicon Detectors, CAL
- Prospects

GRB trigger

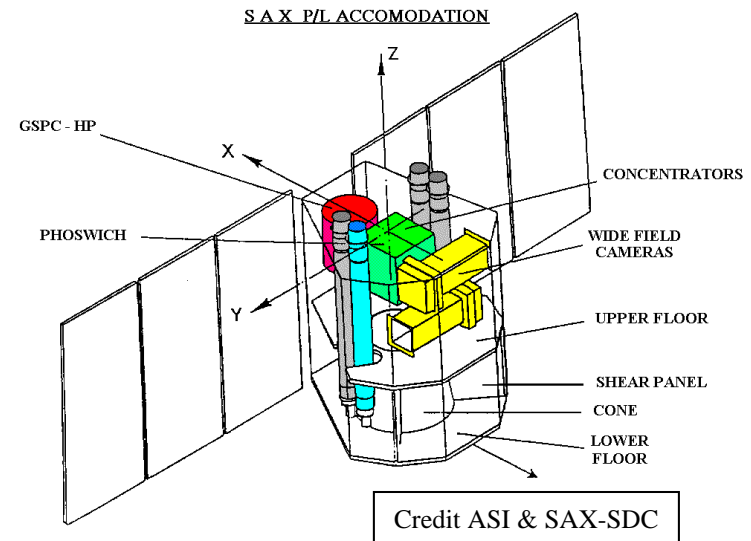


- **CGRO strategy for GRB**
 - BATSE trigger (NaI detectors)
 - COMPTEL burst modes
 - telescope (0.75 – 30 MeV)
 - single detector (~ 0.3 – 10 MeV)
 - EGRET burst operations
 - Imaging (30 MeV – 30 GeV)
 - TASC spectra (1-200 MeV)



Credit NASA

- **BeppoSAX**
 - GRBM trigger (CsI) (40 – 700 keV)
 - WFC detection (2-30 keV)
 - NFI pointings (0.1 – 10 keV)

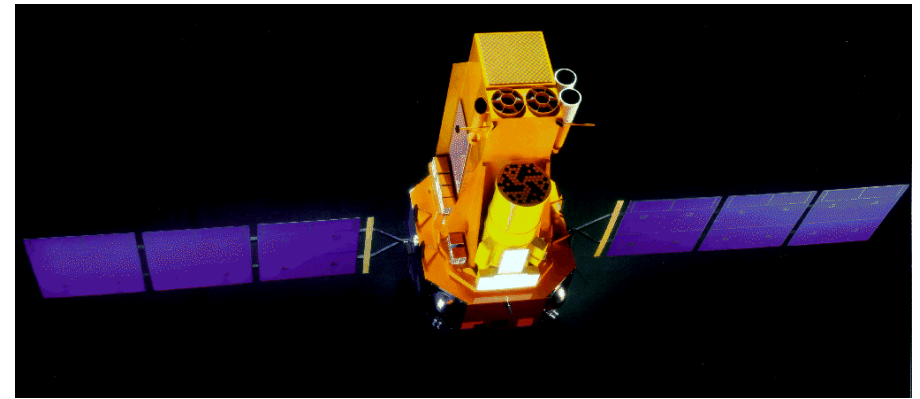


Credit ASI & SAX-SDC

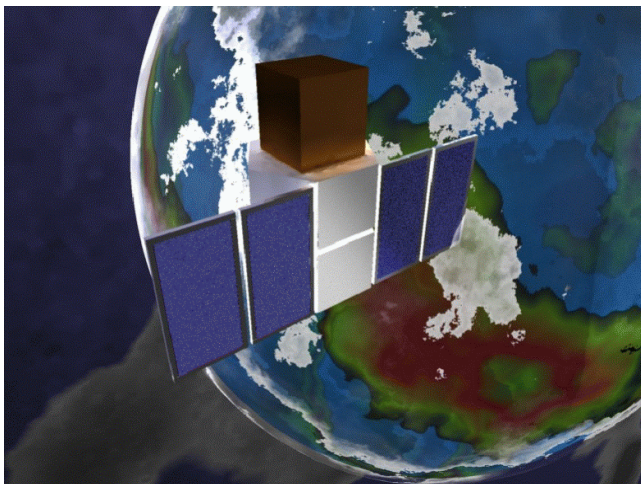
GRB trigger



- **INTEGRAL GRB trigger**
 - IBAS system on ground (images and light curves)
 - IBIS (CsI) imaging (20 keV- few MeV)
 - SPI spectrometer
 - JEM-X and OMC



Credit ESA



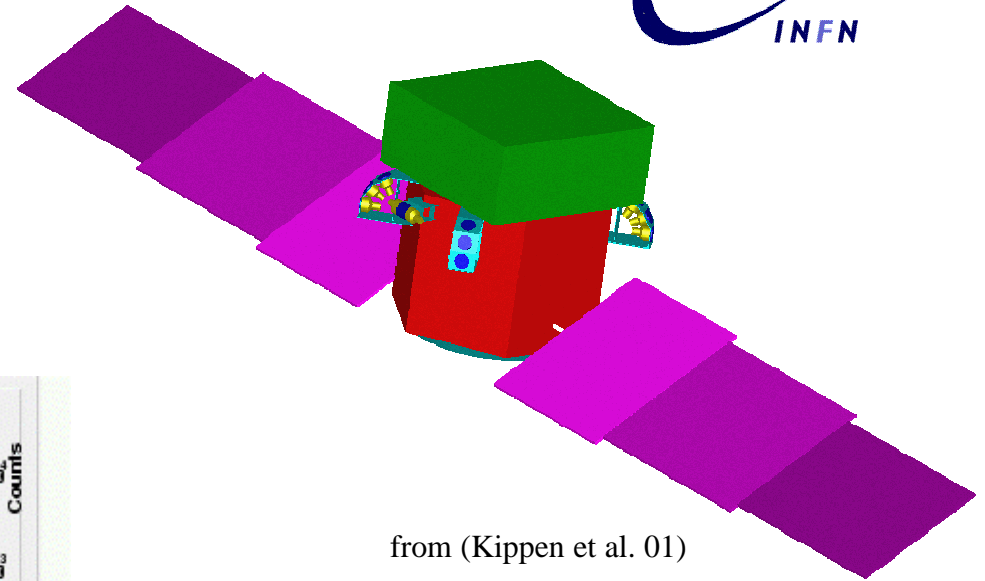
Credit ASI

- **AGILE GRB trigger**
 - SuperAGILE (10-40 keV)
 - MCAL (CsI)(>300 keV - ~ 10 MeV)
 - GRID (30 MeV – 50 GeV)

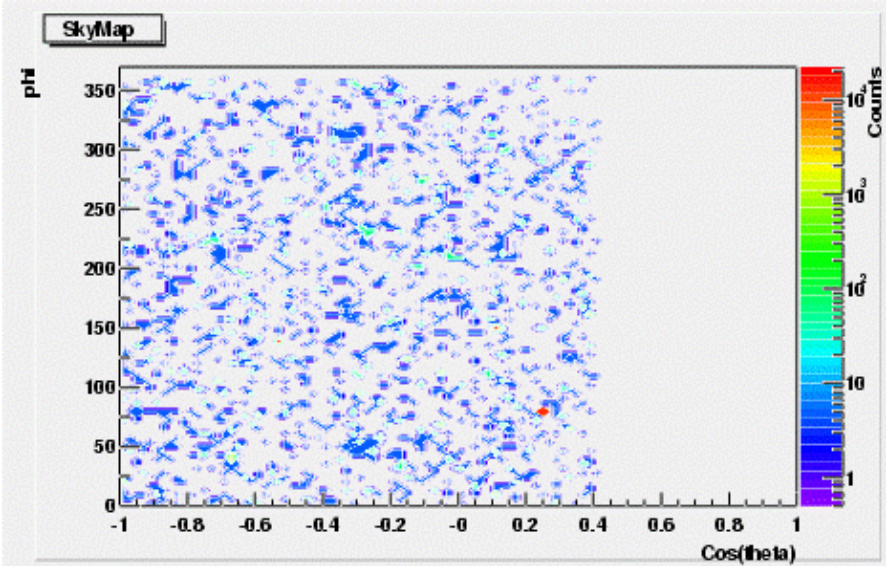


Purpose of Spatial Likelihood

- GLAST GRB strategy
 - GBM trigger (NaI+BGO detectors)
 - LAT trigger and/or “pointing”



from (Kippen et al. 01)



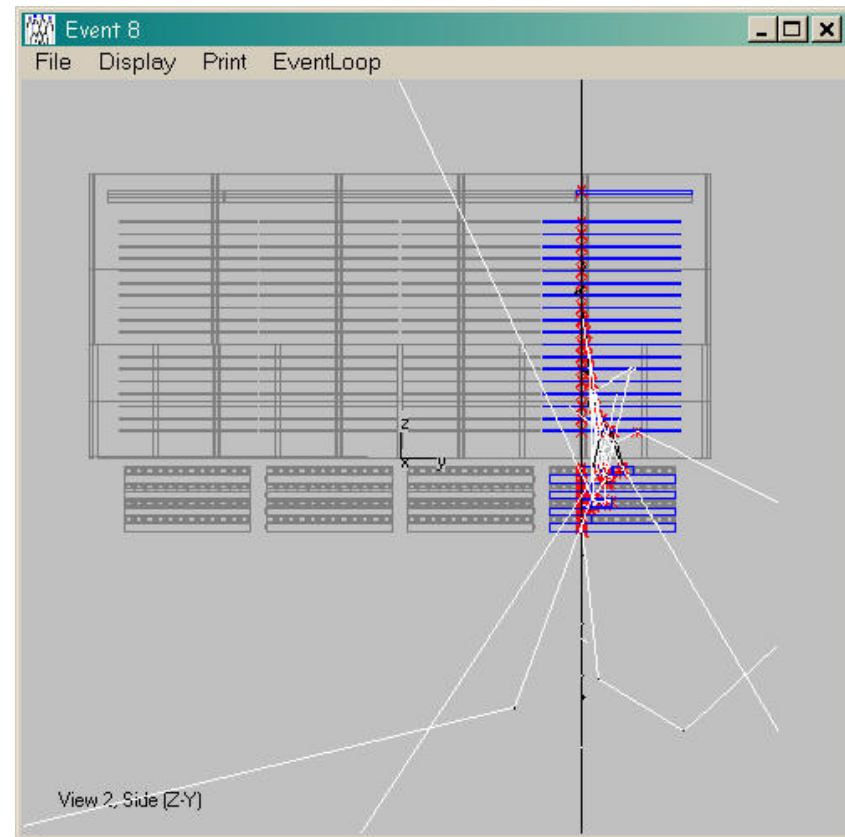
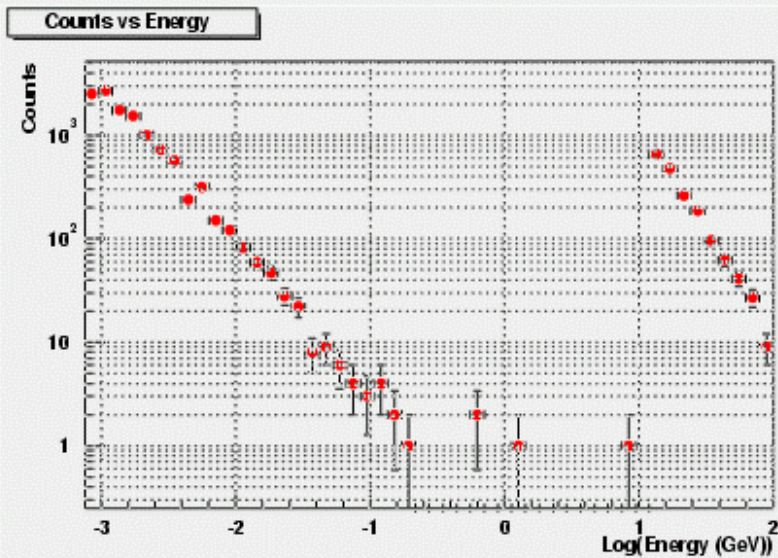
- SPATIAL LIKELIHOOD
 - benefits of GBM info
 - low Gamma-Ray Background
 - combined with Temporal Likelihood

10 s Sky Map by N.Omodei (GalEmSpectrum + GRBSim)

Development of Spatial Likelihood



- SIMULATION
 - GLAST satellite
 - Backgrounds
 - Orbit simulation
 - GRB model
 - Photon detection

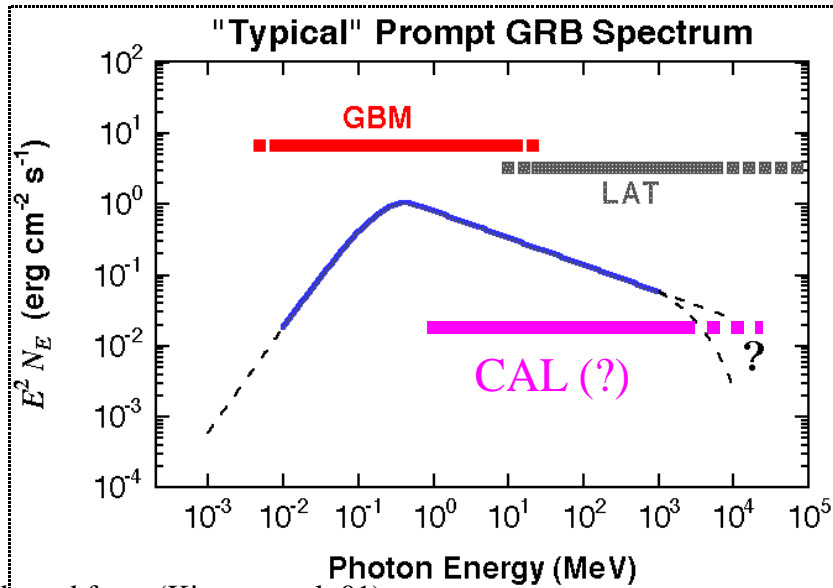
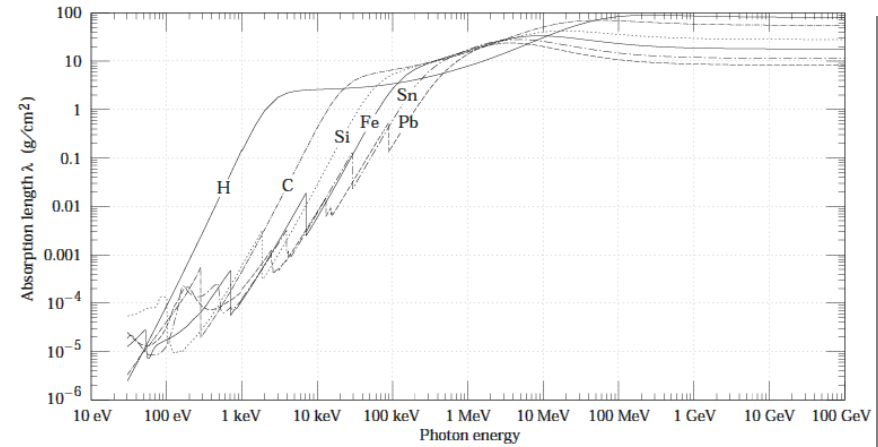


Spectrum by N.Omodei (GalEmSpectrum + GRBSim)



Other suggestions

- ENERGY likelihood
 - CAL info
 - GBM cross-check
 - Low Energies?
 - Use of Silicon Detectors (?)



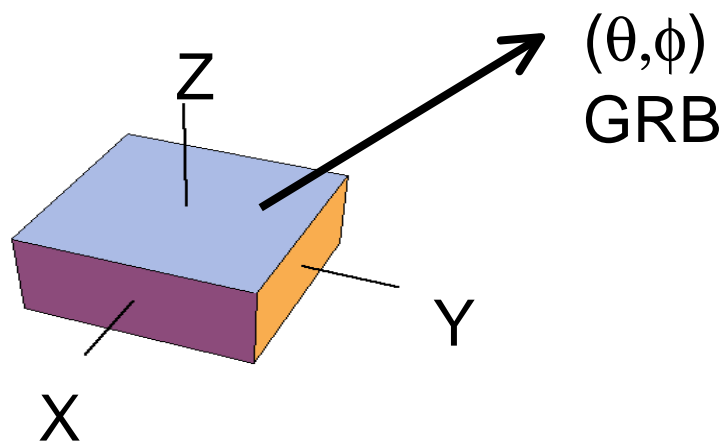
adapted from (Kippen et al. 01)

- CAL trigger
 - ~EGRET TASC mode
 - Huge Effective Area & large FOV
 - Only triggered by GBM(?)
 - Energy Response
 - Simulation

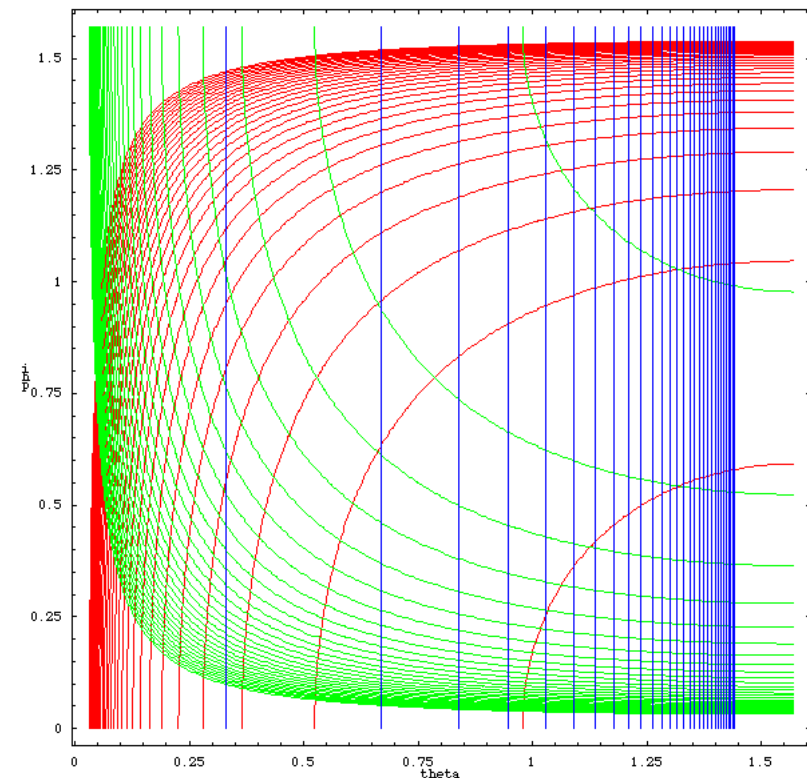


Other suggestions

- ACD trigger
 - ~BeppoSAX GRBM
 - eg. EGRET dome counts
 - additional information
 - arrival time, rates
 - direction (~LOCBURST)
 - external confirmation of trigger



Combined Response



PRELIMINARY