

# Puzzling anisotropy in the distribution of Very Short Bursts

B. Czerny

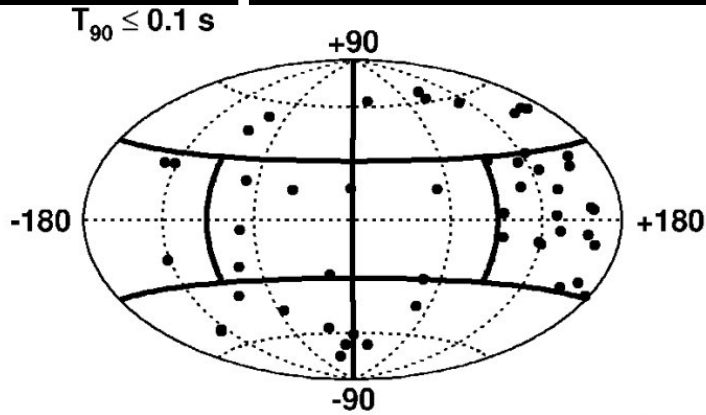
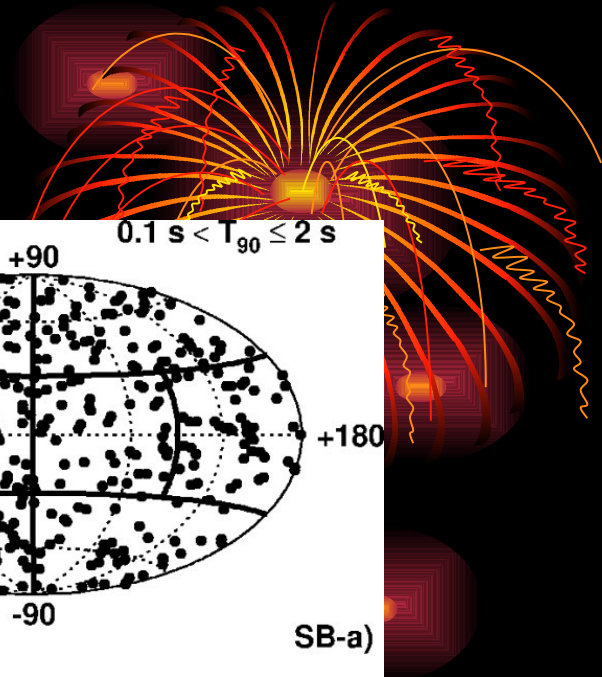
D. Cline, A. Janiuk, C. Matthey,  
S. Otwinoski

# Very Short Bursts

- Definition:  $T_{90} < 0.1$  s
- Motivation: evaporation of primordial black holes (Cline)
- ...
- But do we need a new class?

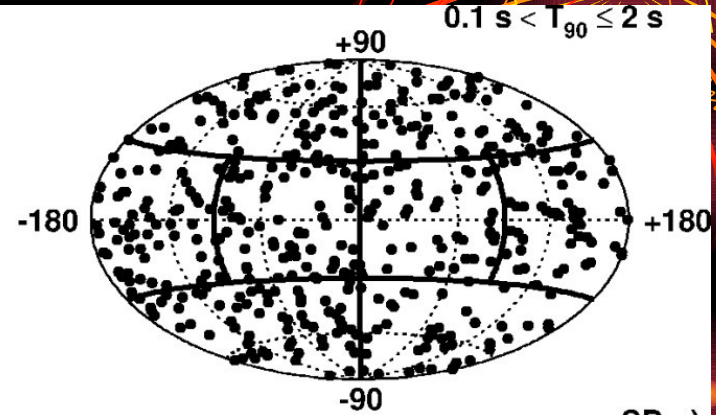


# The puzzle



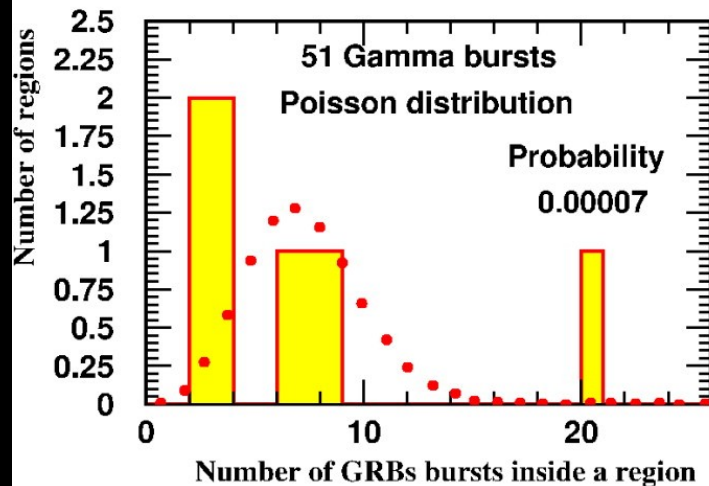
VSB-a)

Galactic Coordinates - 8 regions

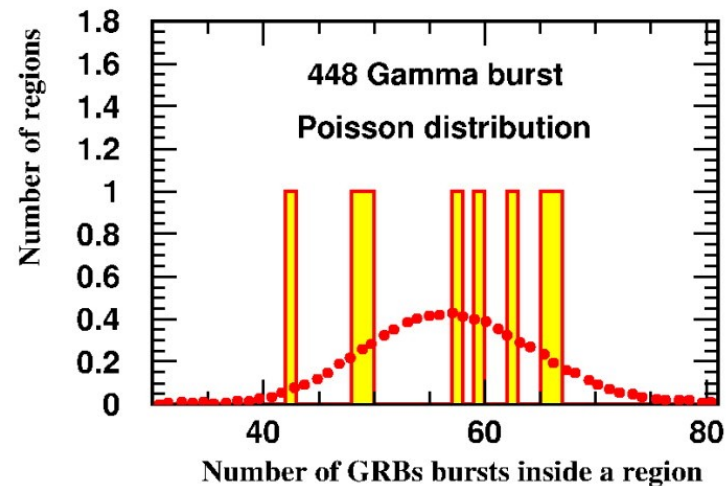


SB-a)

Galactic Coordinates - 8 regions

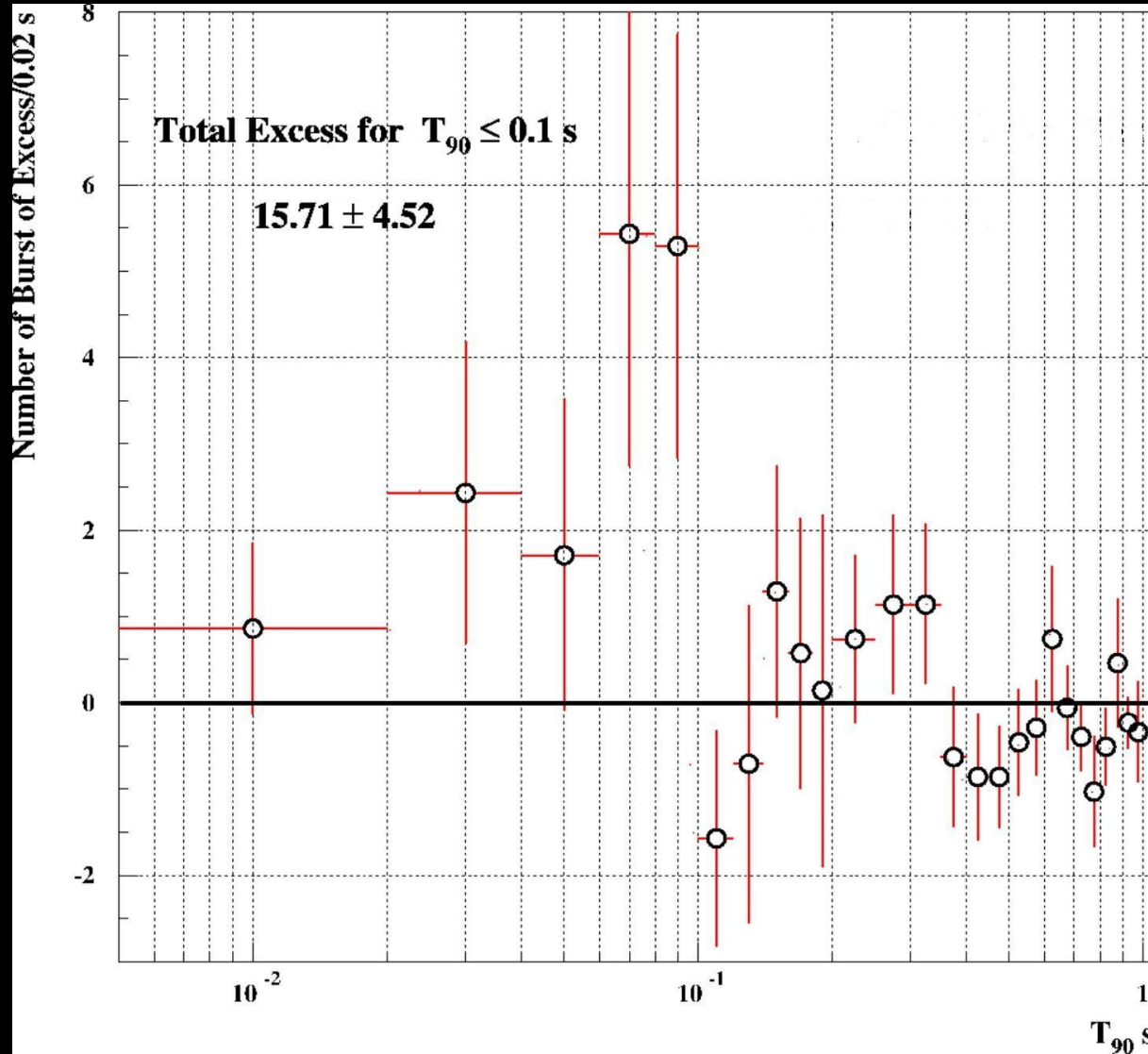


VSB-b)



SB-b)

# The Anticenter region



There is an excess of VSB events and  $T_{90} = 0.1$  s by pure accident corresponds to the limit. No excess of bursts with  $T_{90}$  above 0.1 s

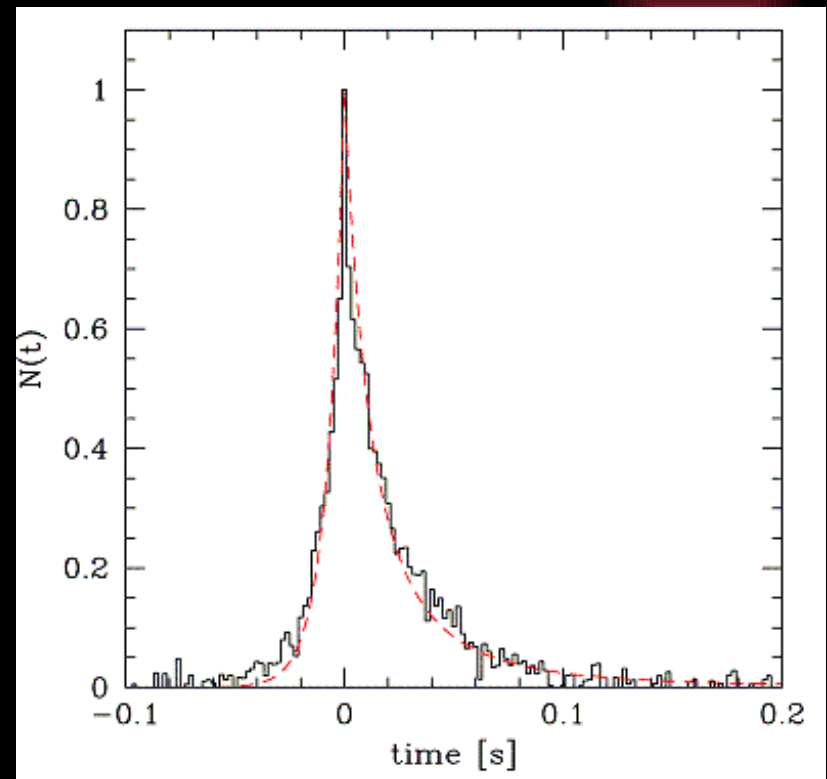
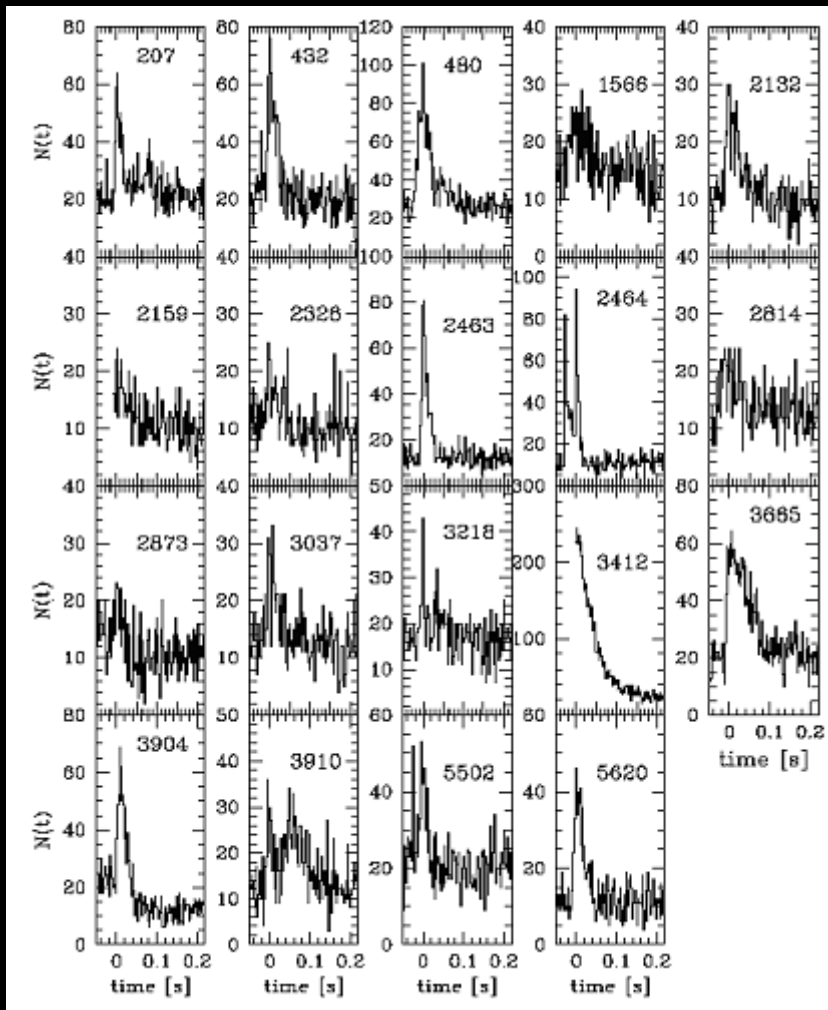
*Cline et al. 2005*



# Profiles



Averaged profile of VSBs



# Background

- Background for VSB in the Anticenter region:  $12\,500 \pm 1000$  cts/s
- Background for other regions:  $13\,800 \pm 1300$  cts/s

This difference seems too small to account for the enhancement



# SWIFT

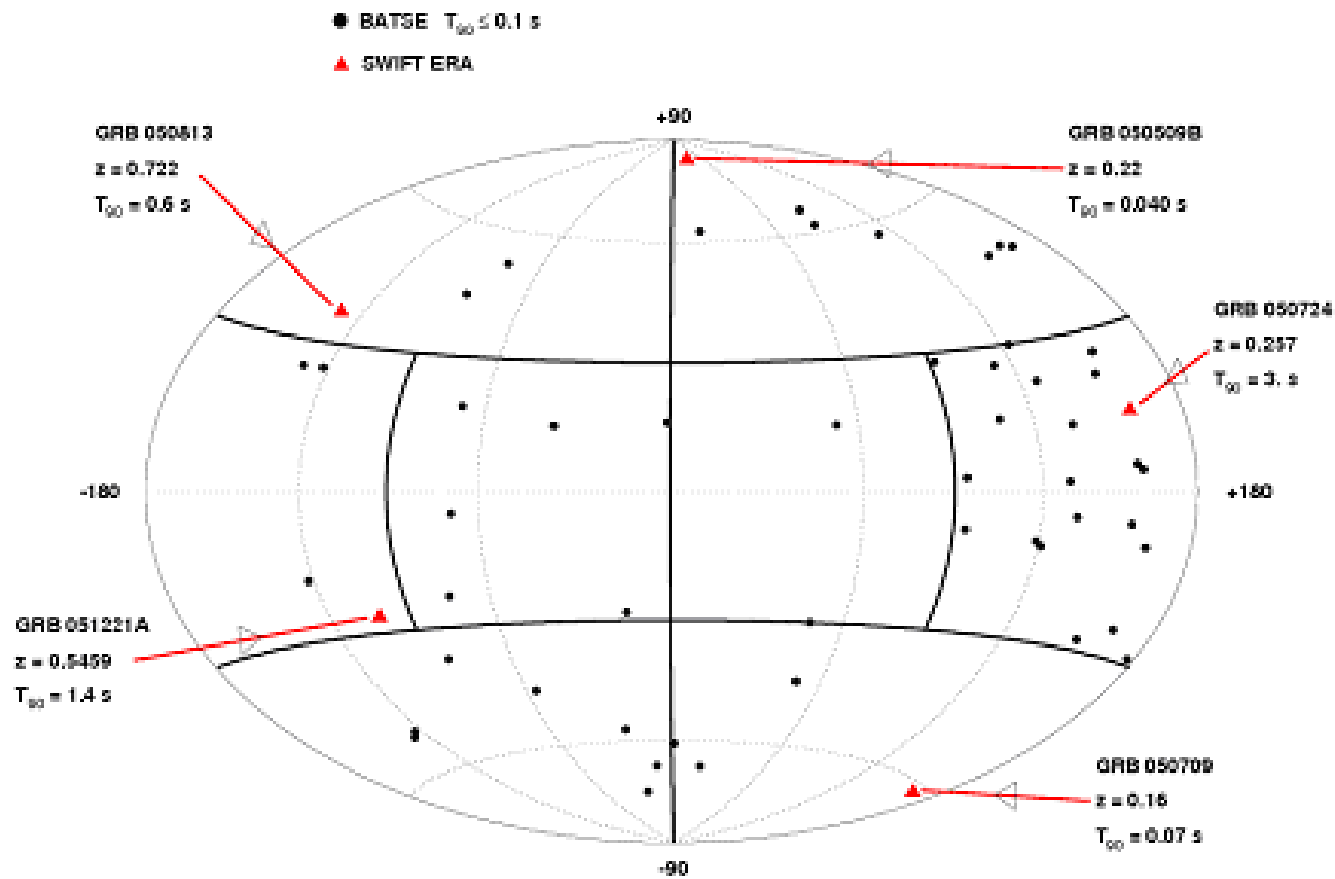
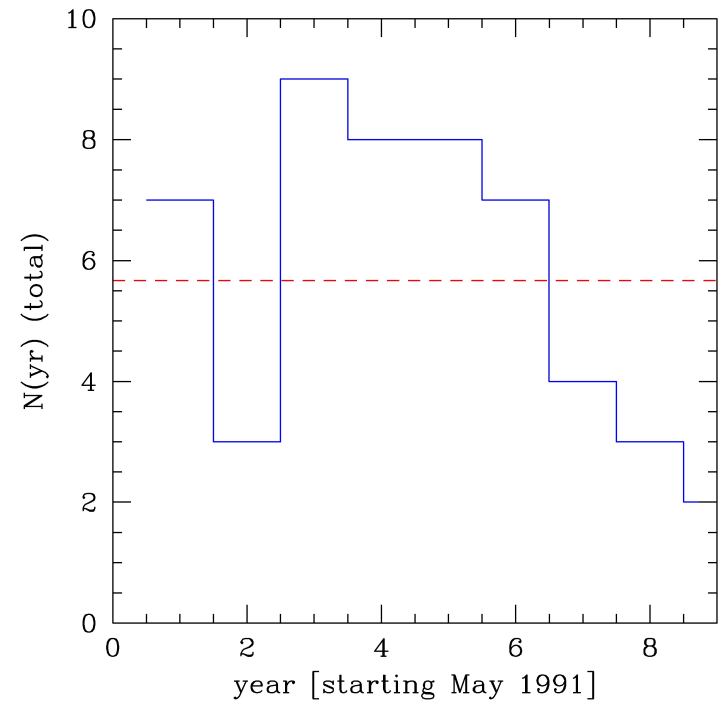
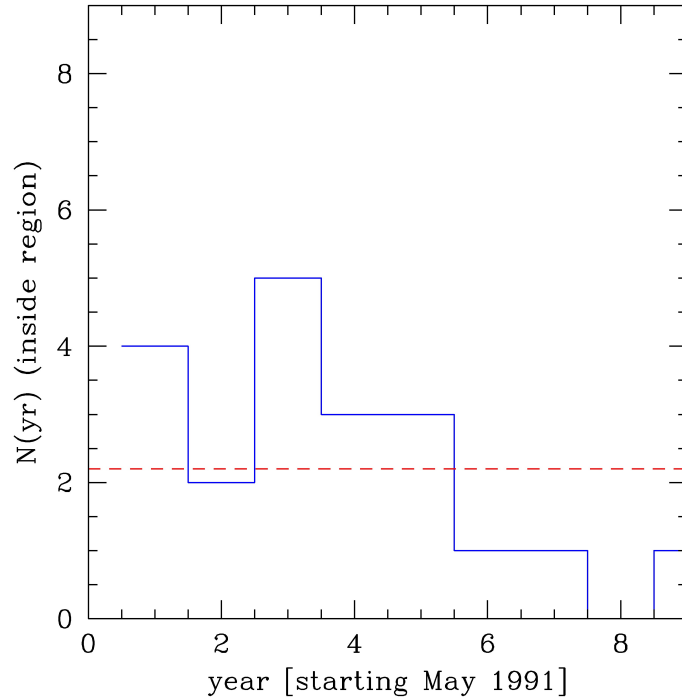


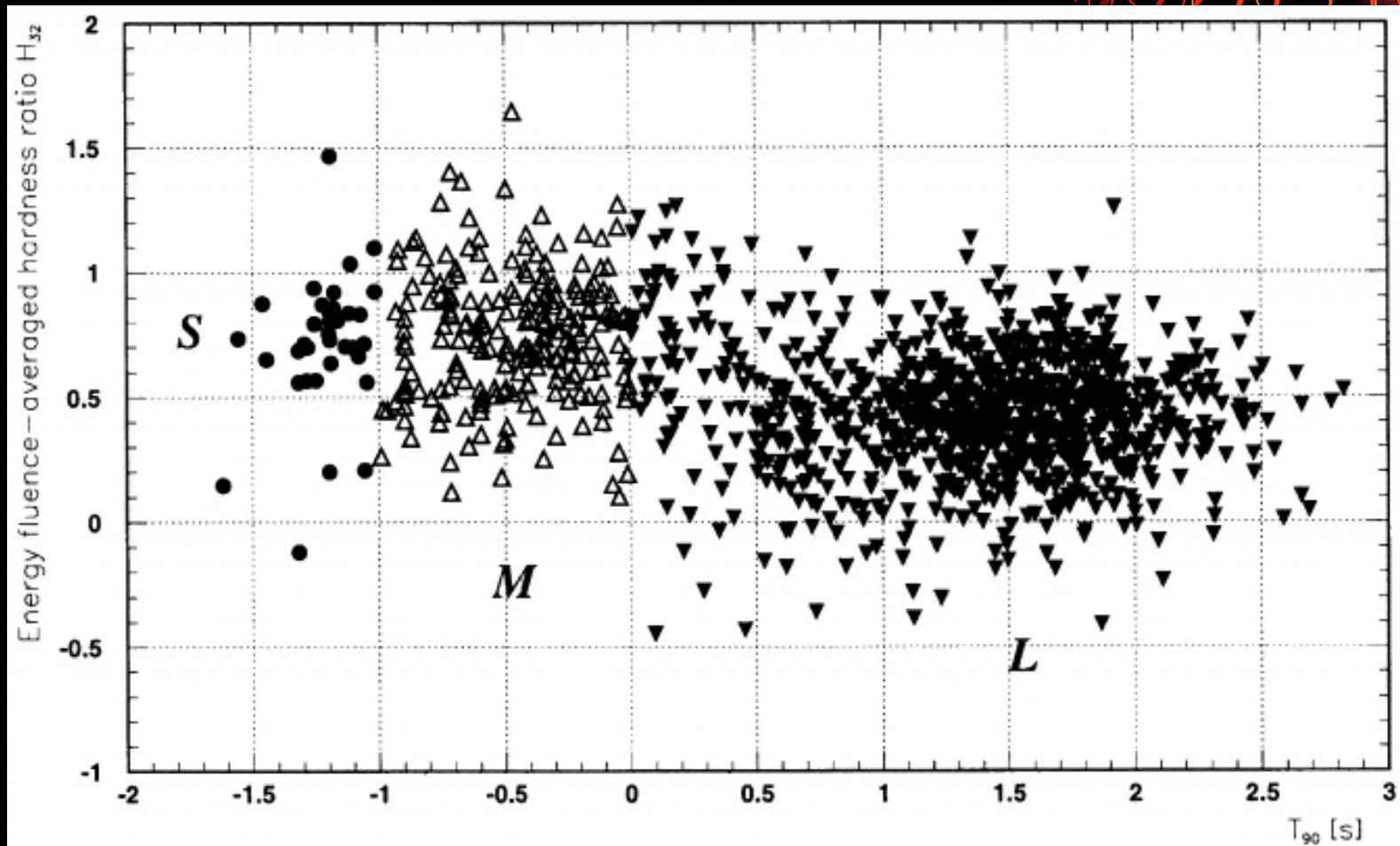
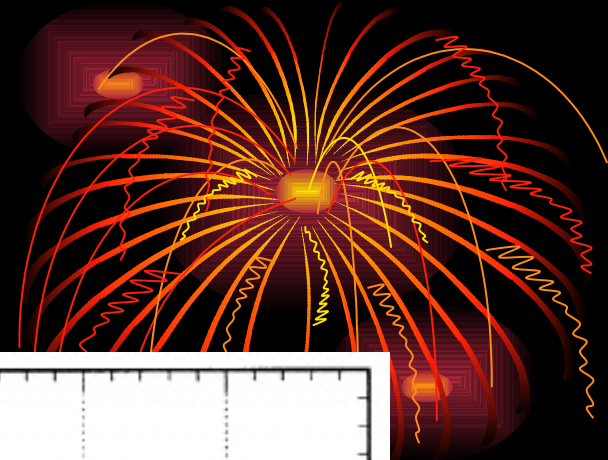
Fig.1 GRBs - Galactic Coordinates

# Arrival times



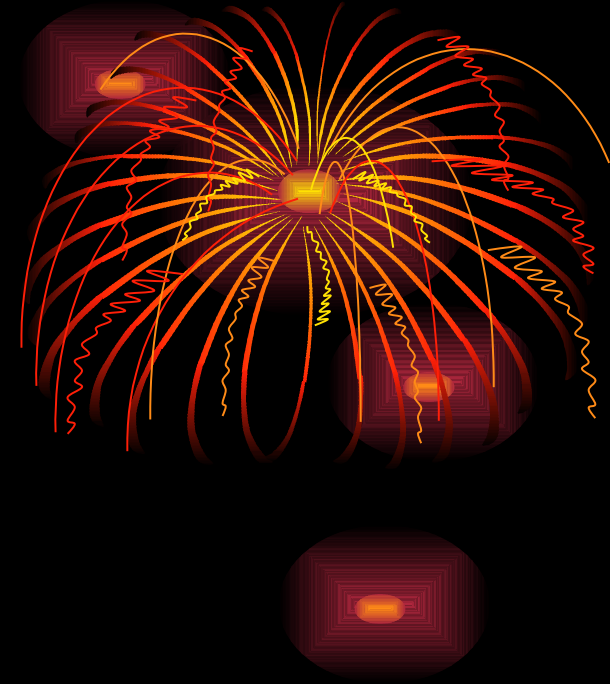
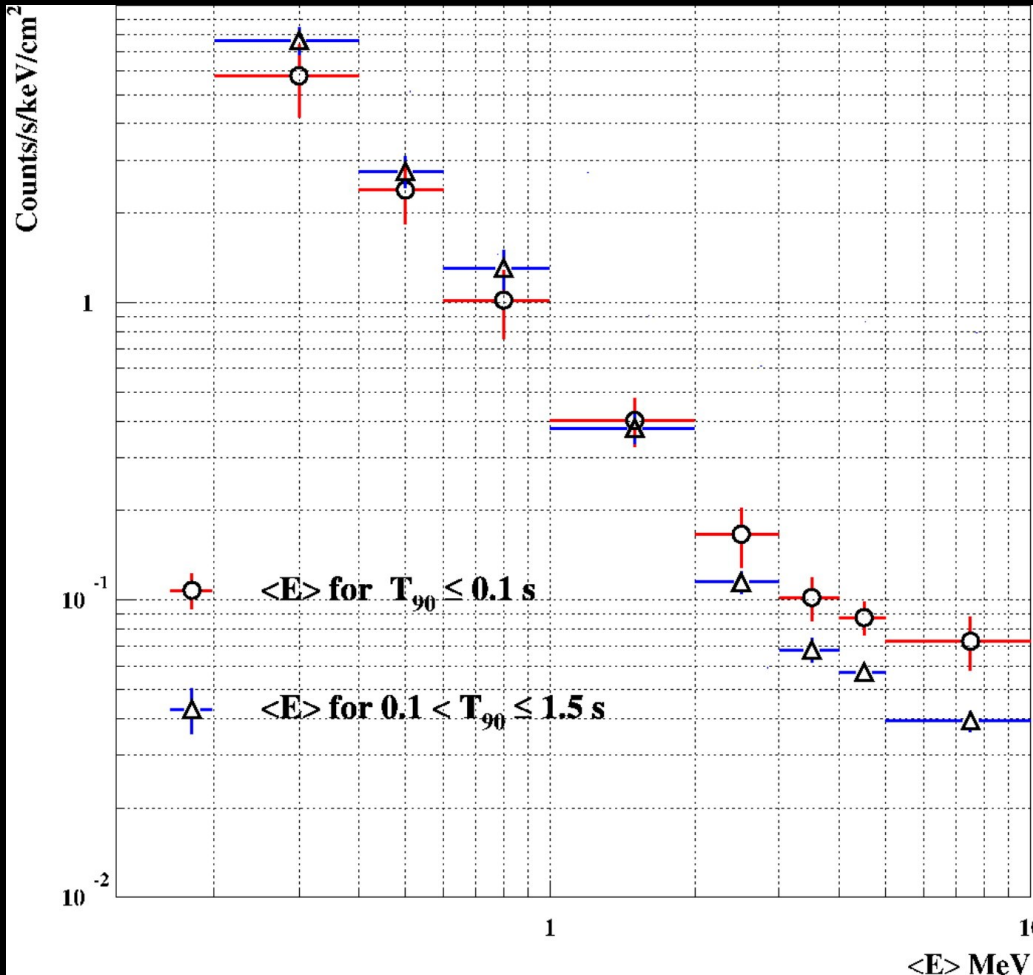


# Spectra



*Cline et al. 1999*

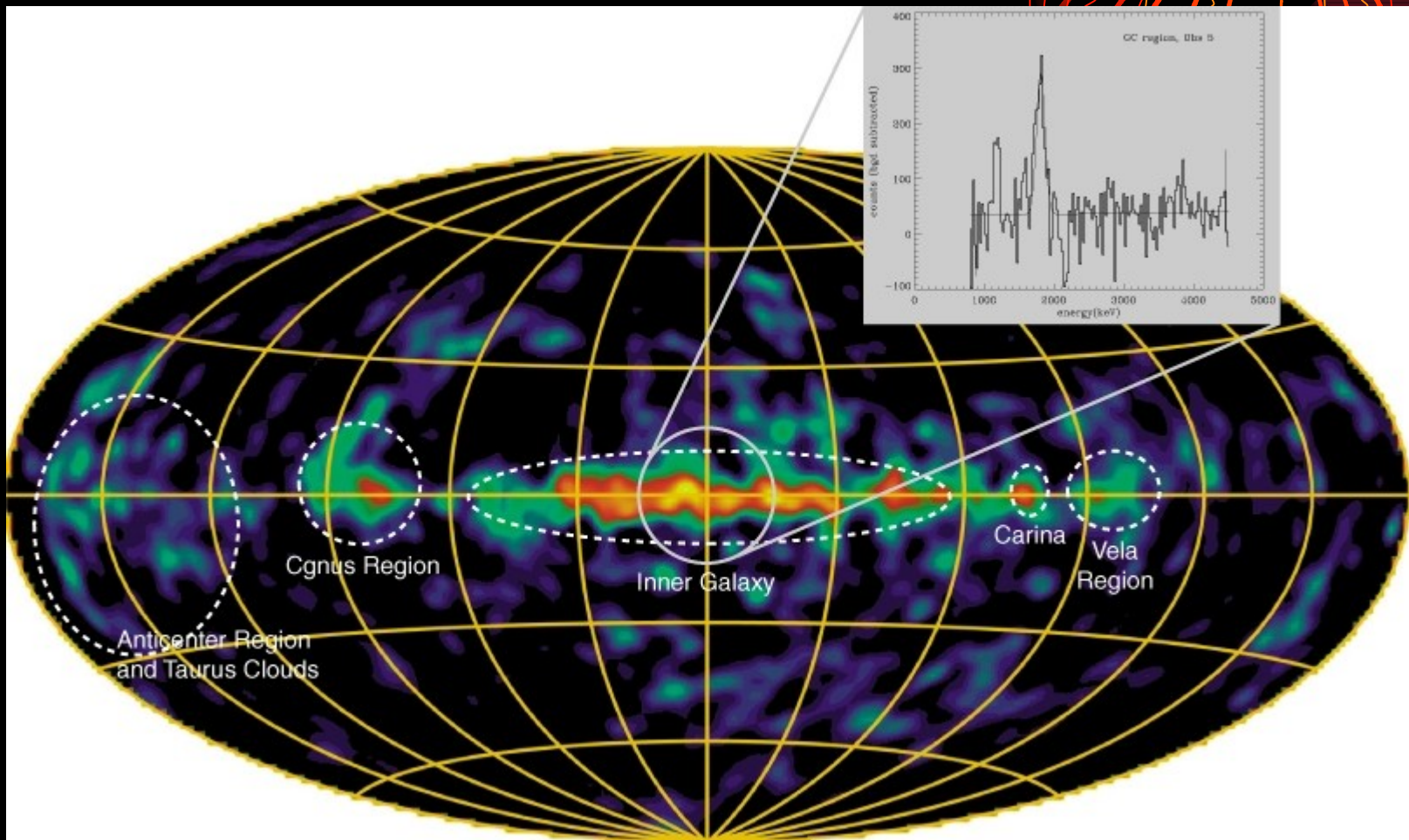
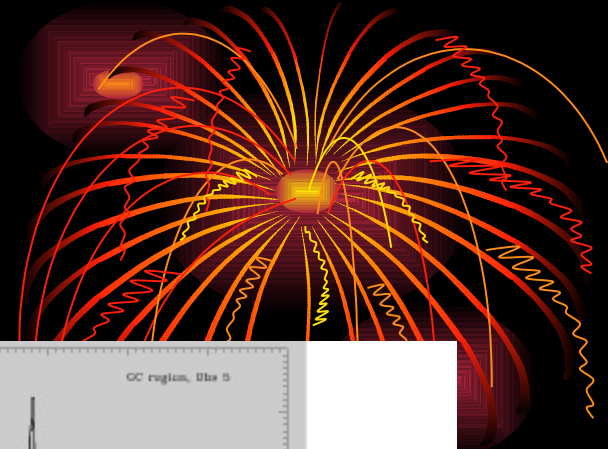
# VSB from KONUS



VSB seem to be harder,  
particularly at very high  
energies

*(Cline et al. 2005)*

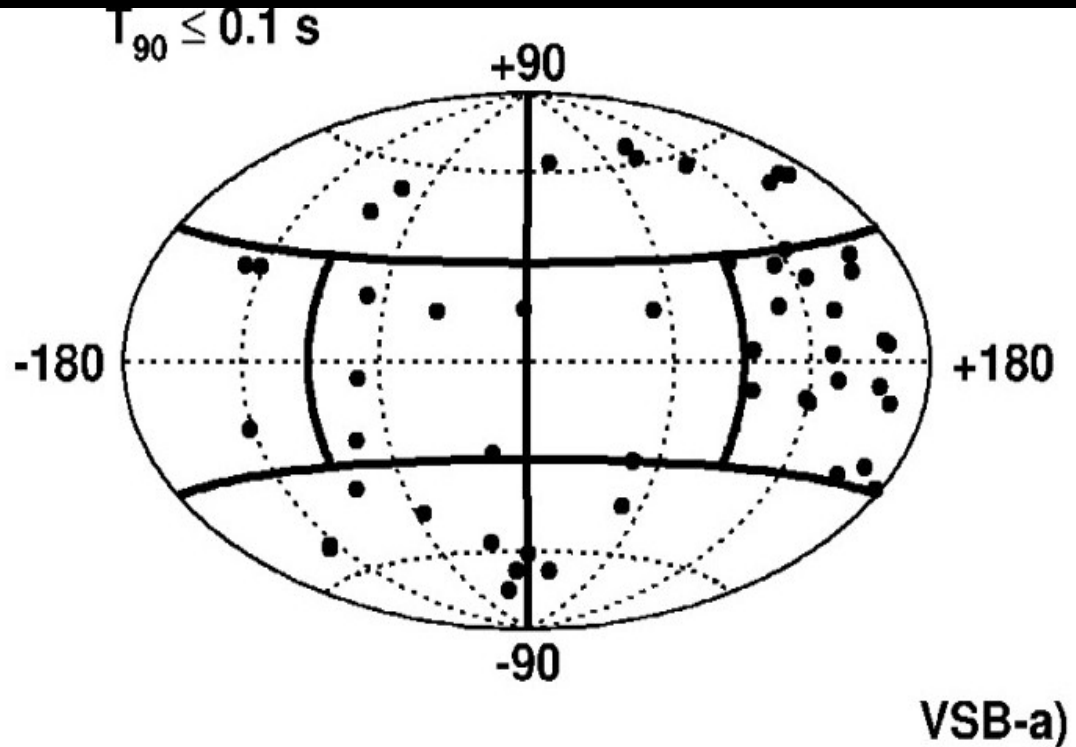
# Anticenter region



Comptel – Al26 map

# The puzzle:

- intrumetal effect in BATSE?
- Something connected with Taurus clouds?



Galactic Coordinates - 8 regions