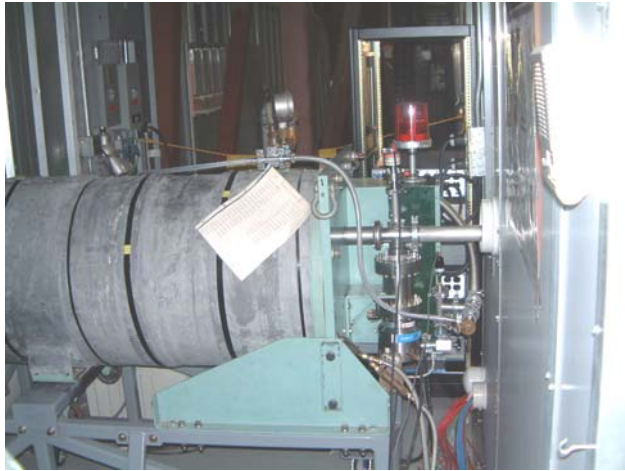


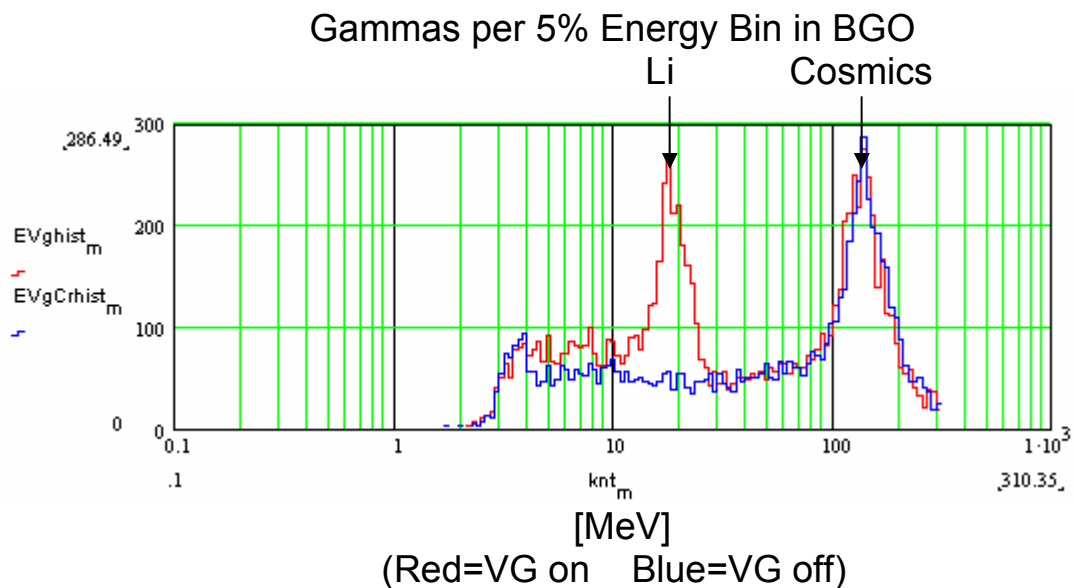
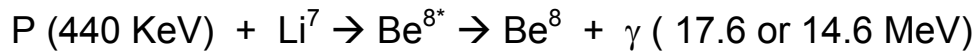
# Van de Graaff Photon Rates

May 12, 2004 GLAST All Hands Meeting  
Gary Godfrey

- 1) The Van de Graaff (VG) has been rebuilt with an oil free vacuum system and is reinstalled by the Bldg 33 cleanroom.

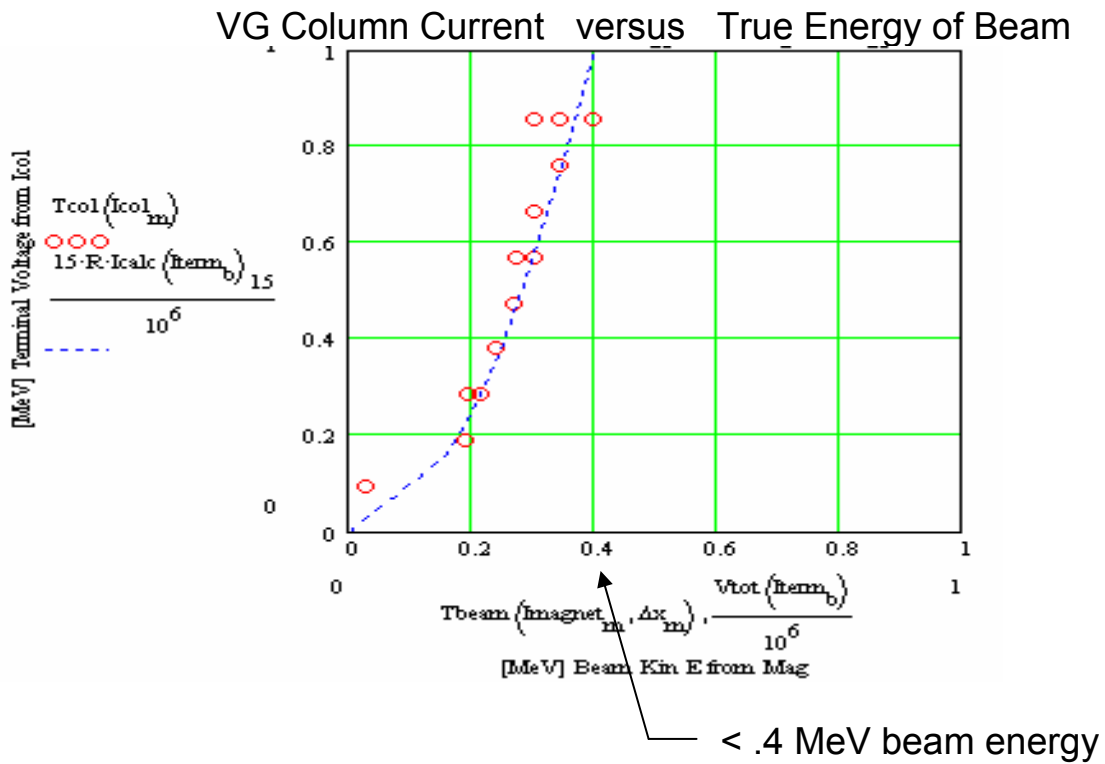


- 2) The VG now produces 17 MeV gammas from a Li target at the same rate it did for the EM test.



Expect ~100 times more 17 MeV  $\gamma$ s, but VG can't reach 440 keV.

3) Measured the true beam energy by bending the beam with a magnet

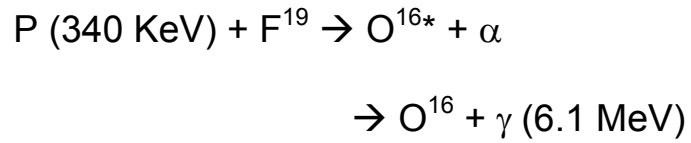


The manufacturer says that VG model LC-400 has a 400 KeV max energy.

When the magnet is on, two spots are seen on the scintillator. The dim (~10%) spot is from protons ( $H^+$ ) and the bright (~90%) spot is from  $H_2^+$ .

The spots are typically ~1 cm diam but can sometimes be focused to ~3 mm diam.

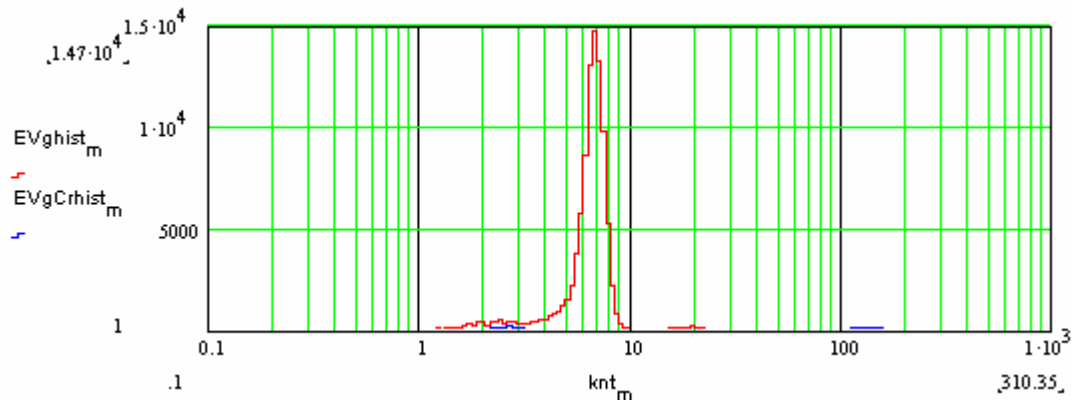
4) For the high rate LAT trigger test, a different target (LiF) and gamma ray energy will be used.



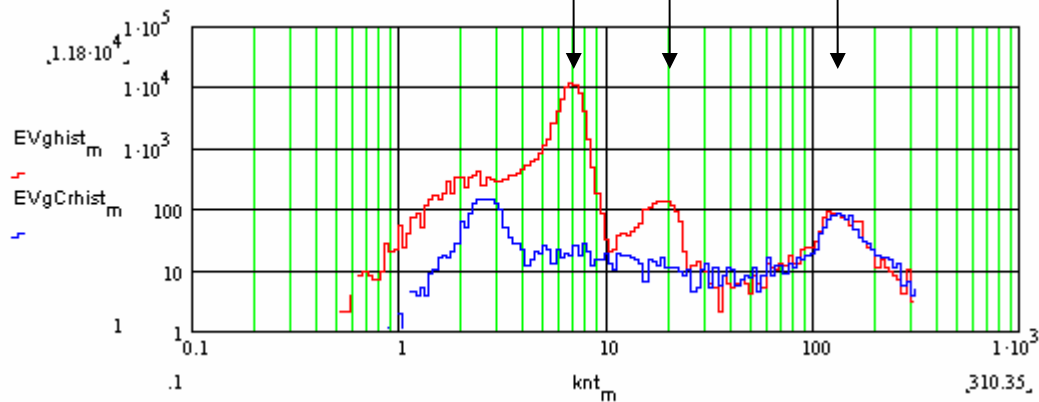
When the  $O^{16*}$  resonance is hit, this reaction produces  $1.7 \times 10^{-8} \gamma/\text{proton}$  (similar to the  $1.9 \times 10^{-8} \gamma/\text{proton}$  for the 17 MeV  $\gamma$ s from Li).

Linear counts

Gammas per 5% Energy Bin in BGO



Log counts



[MeV]

(Red=VG on Blue=VG off)

5) Summary of best average VG rates over ~20 minute run.

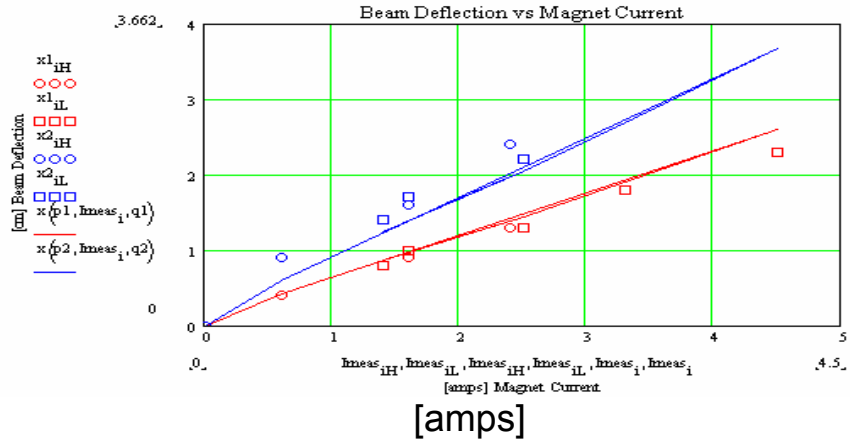
Target (Lines)	[ $\gamma/\text{sec}$ ] into $4\pi$ sterad	LAT 6 hit TkrTrig Rate (MC acceptance) [Hz]
LiF (17.6 + 14.6 MeV $\gamma$ )	1,200	300
LiF (6.1 MeV $\gamma$ )	76,000	1,900 - 19,000 (in progress)

# Extra Slide

Magnetic analysis of beam shows two spots due to  $H^+$  and  $H_2^+$ .

[cm]

### Beam Deflection versus Magnet Current



Blue= dim(~.1) spot, and curve is for 320 KeV  $H^+$  (makes the  $\gamma$ s)  
Red= bright(1) spot, and curve is for 320 KeV  $H_2^+$

Thus, beam energy is 320 KeV for this 75 uA column current.