# Generating the Instrument Response Functions

- **We generate IRFs starting from MC simulations and then applying corrections as need based on flight-data**
- **Simulations details:**
    - **Full GEANT simulation of particle interactions with the LAT**
        - **Detailed detector geometry**
        - **Detailed particle interaction models**
        - **Calibrated instrument response to particles**
- **For IRFs, we only need to simulate γ-ray sample**

The "allGamma" Monte Carlo sample

Steps to generating allGamma MC simulation:

1) Randomly select a direction (v)
2) Make a circle with area 6m^2 normal to that direction
3) Pick a point on that circle
4) Back away by about 10 m in (v)
5) Throw the particle at the LAT along (v)
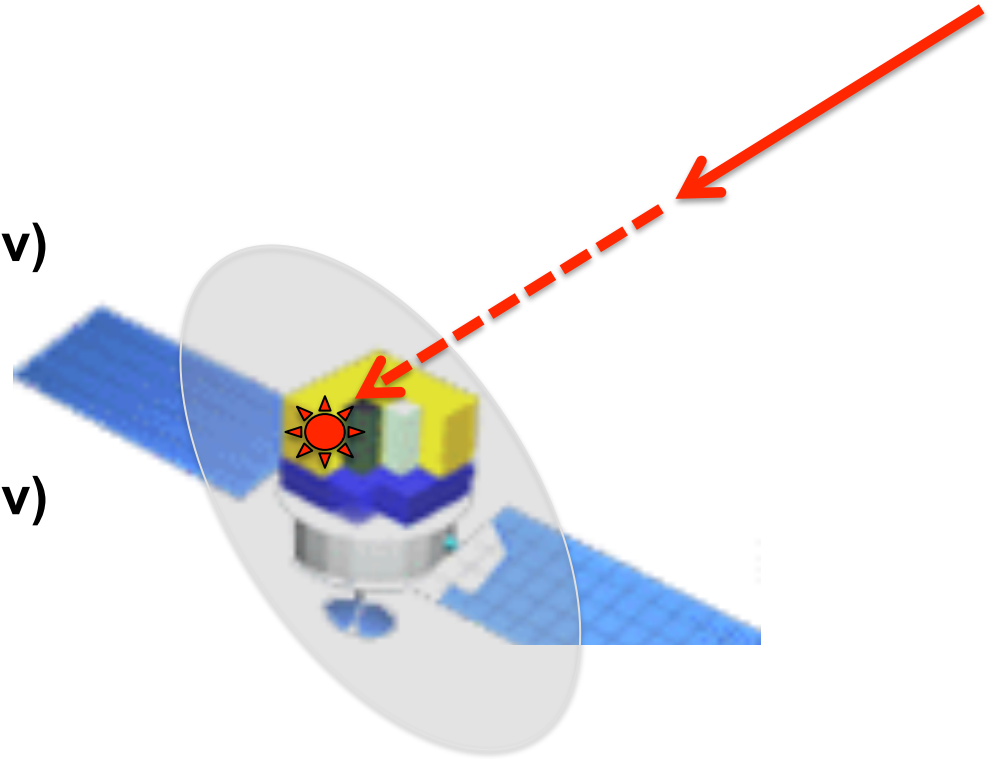
Considerations for making the A_{eff} Tables

- Parameterization: what variables do we tabulate A_{eff} for?
- Binning: how many values of the A_{eff} will we need?
- Computation: how do we calculate A_{eff} for a particular bin?

Extra Columns in Monte Carlo "photon" Files.

- **format = 'E', name = 'MC_DIRERR'**
  - **Angular separation between true and recon. directions.**
- **format = 'E', name = 'MC_ENERGY'**
  - **True γ-ray energy**
- **format = 'E', name = 'MC_DEC'**
- **format = 'E', name = 'MC_RA'** ⎫ **Arbitrary Pointing**
- **format = 'E', name = 'MC_XDIR'**
- **format = 'E', name = 'MC_YDIR'** ⎫ **True direction in LAT Frame**
- **format = 'E', name = 'MC_ZDIR'**