Analysis of WIMP Annihilation at the Galactic Center

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1. Perform complete search for dark matter using EGRET data
2. Develop software interfaces which allow easy substitution of GLAST data and detector response
EGRET events from GC (E > 2 GeV)
Analysis topics

1. Variability of measured flux
2. Estimate of cosmic ray induced gamma rays in central molecular zone
3. Multi-frequency analysis
   a. Pulsar counterpart matching - potential background
   b. Counterpart matching from radio – expect electron synchrotron radiation from WIMP annihilation
Prompt photon analysis chain

1. Generate PYTHIA b-bbar event ($E_{\text{CM}}$)
2. List of $n_\gamma$ prompt photons $\{E_\gamma\}$
3. Monte Carlo detector response ($\theta_{67\%}$, $\Delta E_{\%\text{FWHM}}$)
4. Monte Carlo location of photon (cusp slope, $r_{\text{min}}$)
5. List of $n_\gamma$ measured photons $\{b_\gamma, l_\gamma, E_\gamma\}$
6. Cosmic ray induced diffuse $\{b, l, E\}$
7. Bkgd + signal combined map $\{b, l, E\}$
PYTHIA gammas from b-bbar decay
Spectral ratios

\( R_{\text{Diffuse}} \)

\( R_{\text{diffuse+DM}} \)

\( \Omega_\chi = 0.2, \ M_\chi = 50\text{-GeV} \)

Moore N-body profile

\( R_{\text{diffuse+DM}} / R_{\text{Diffuse}} \)

\( R_{\text{EGRET Data}} / R_{\text{Diffuse}} \)