

Discussion on Gamma-ray Constraints

Consensus#1

IF:

1. the secondary gamma-ray photons from cosmic-ray protons produced by blazars do not contribute; and
2. there exists a lower bound on the photon index, $\Gamma_{\min}=1.5$ (i.e., $dN/dE \sim E^{-\Gamma}$ with $\Gamma \geq 1.5$); then

"The current data on spectra of TeV gamma-rays from blazars indicate that most of the total sky brightness measured by IRTS, DIRBE, NICMOS (before median filter), and CIBER is something like Zodi.

Consensus#2

IF:

1. the secondary gamma-ray photons from cosmic rays produced by blazars do contribute; then

"The current data on spectra of TeV gamma-rays from blazars are unable to place an upper bound on EBL."

Consensus#3

How reasonable is a lower bound on the photon index, $\Gamma_{\min}=1.5$? Some blazars detected by Fermi show $\Gamma \sim 1.3$, but 1.5 is still consistent within the error bar. Also, it is possible that the current Fermi error bar on Γ is underestimated. Finally, taking $\Gamma \sim 1.3$ (instead of 1.5) as a lower bound does not change the conclusion from Consensus#1. However, the intrinsic spectrum can be harder than even $\Gamma \sim 1.3$.

Consensus#4

Gamma-ray photons coincident with GRB cannot be explained by the secondary gamma-rays from cosmic-ray protons. Therefore, GRB would play an important role in figuring out whether most of the total sky brightness is EBL or something like Zodi.