APR10-2009-000166

Abstract for an Invited Paper
for the APR10 Meeting of
the American Physical Society

Highlights from Fermi Gamma-Ray Space Telescope observations of Gamma-Ray Bursts[1]

JONATHAN GRANOT, University of Hertfordshire

The Fermi Gamma-Ray Space Telescope has more than doubled the number of Gamma-Ray Bursts (GRBs) detected at high energies (> 100 MeV) within its first year of operation. Thanks to the very wide energy range covered by Fermi's Gamma-ray Burst Monitor (GBM; 8 keV to 40 MeV) and Large Area Telescope (LAT; 25 MeV to > 300 GeV) it has measured the prompt GRB emission spectrum over an unprecedentedly large energy range (from ~ 8 keV to ~ 30 GeV). I will present highlights from Fermi GRB observations focusing mainly on the prompt emission phase. Interesting new observations will be discussed along with some of their possible implications, including: (i) What can we learn from the Fermi-LAT GRB detection rate, (ii) A limit on the variation of the speed of light with photon energy (for the first time beyond the Planck scale for a linear energy dependence from direct time of arrival measurements), (iii) Lower-limits on the bulk Lorentz factor of the GRB outflow (of ~ 1000 for the brightest Fermi LAT GRBs), (iv) The detection (or in other cases, lack thereof) of a distinct spectral component at high (and sometimes also at low) energies, and possible implications for the prompt GRB emission mechanism, (v) The later onset (and longer duration) of the high-energy emission (> 100 MeV) compared to the low-energy (< 1 MeV) emission that is seen in most Fermi-LAT GRBs.

[1]J. Granot gratefully acknowledges a Royal Society Wolfson Research Merit Award.