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Centre attaché à l'Observatoire de Genève



UNIVERSITÉ DE GENÈVE

ASTROPHYSICS SEMINAR



Tuesday, 21 June 2005 at 11:00

Evidence of polarisation in the prompt gamma-ray emission from GRB 930131 and GRB 960924

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Abstract. The true nature of the progenitor to Gamma-Ray Bursts (GRBs) remains elusive; one characteristic that would constrain our understanding of the GRB mechanism considerably is gamma-ray polarimetry measurements of the initial burst flux. We present a method that interprets the prompt GRB flux as it Compton scatters off the Earth's atmosphere, based on detailed modelling of both the Earth's atmosphere and the orbiting detectors. The BATSE mission aboard the Compton Gamma-Ray Observatory (CGRO) monitored the whole sky in the 20 keV - 1 MeV energy band continuously from April 1991 until June 2000. We present the BATSE Albedo Polarimetry System (BAPS), and show that GRB 930131 and GRB 960924 provide evidence of polarisation in their prompt flux that is consistent with degrees of polarisation of $\Pi > 35\%$ and $\Pi > 50\%$, respectively. While the evidence of polarisation is strong, the method is unable to strongly constrain the degree of polarisation beyond a systematics based estimation. Hence the implications on GRB theory are unclear, and further measurements essential.

Additional Information

The seminars are given in the ISDC "Pavillon" building
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