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Gamma-Ray Burst Prompt Emission Polarimetry: an Overview

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One of the main targets of astrophysical X- and gamma-ray polarimetry has been the prompt emission of Gamma-Ray Bursts (GRBs). This polarization is theorized to hold a wealth of information on the nature of these extreme events prompting a range of attempts at measuring it over the last 20 years. Initial attempts to measure it using non-dedicated instruments, such as BATSE, RHESSI and INTEGRAL SPI and IBIS, were followed in the last decade by the first attempts using instrumentation fully dedicated to this purpose like GAP and POLAR. Although close to 50 GRB polarization measurements have been reported thus far and great progress has been made regarding instrumentation and analysis techniques, no clear picture of the GRB prompt polarization properties exists to date. This is due, in part, to the extreme difficulties in performing such measurements as well as potentially due to the complex nature of the polarization. During this talk I will present the various measurements performed over the last two decades along with the various encountered issues and problems. In addition, I will present the progress made in recent years within the field which can lead to the first conclusive measurements to be performed during the coming decade.

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