



Contribution ID: 1036

Type: Talk

POLAR-2 –Latest Developments of the Next Generation GRB Polarimeter

Wednesday 16 July 2025 13:50 (15 minutes)

Gamma-Ray Bursts (GRBs) are among the most energetic events in the Universe. Despite over 50 years of research and measurements their prompt emission remains poorly understood, with key questions surrounding the structure of relativistic jets, magnetic field configurations, and dominant radiation mechanisms. Polarization measurements are critical in resolving these uncertainties. The POLAR mission, operational in 2016-2017 on Tiangong-2, provided the most statistically significant GRB polarization data. Its results indicated low time-averaged polarization with hints of temporal evolution. However, POLAR's limited sensitivity, small effective area, and restricted energy range prevented more detailed time- and energy-resolved analyses in addition to a larger sample of GRB polarization measurements. POLAR-2 is designed to address these limitations by offering a fourfold increase in effective area (at least) and an extended energy range of 30–800 keV by utilizing Silicon Photomultipliers (SiPMs) and an updated module design, enabling the differentiation of competing GRB emission models. The instrument comprises of 100 polarimeter modules (each with 64 plastic scintillator bars), wherein the polarization angle is extracted through Compton Scattering of the gammas. The polarimeter module design was validated during an ESRF beam test campaign in 2023. The instrument was developed by a joint effort of Switzerland, China, Poland and Germany and is planned for launch in 2027. Currently, POLAR-2 is in its production phase with the first module targets being produced. We will provide an overview of the current status of the development.

Collaboration(s)

POLAR-2

Authors: HULSMAN, Johannes (Universite de Geneve (CH)); AZZARELLO, Philipp (Département de Physique Nucléaire et Corpusculaire (DPNC), Université de Genève, 24 quai Ernest-Ansermet, CH-1211 Genève 4, Switzerland); ON BEHALF OF THE POLAR-2 COLLABORATION

Presenter: AZZARELLO, Philipp (Département de Physique Nucléaire et Corpusculaire (DPNC), Université de Genève, 24 quai Ernest-Ansermet, CH-1211 Genève 4, Switzerland)

Session Classification: GA

Track Classification: Gamma-Ray Astrophysics