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POLAR-2: Towards Large Scale Gamma-ray Polarimetry

The POLAR-2 gamma-ray burst (GRB) polarimetry mission is a follow-up of the successful POLAR mission which has collected data during 6 months on board the Chinese Tiangong-2 spacelab in 2016-2017. From the polarization studies on 14 GRBs, POLAR measured an overall low polarization as well as an unexpected complexity in the time evolution of the polarization during a GRB. These results indicate that measurements with a significantly improved precision are required. Furthermore, with the recent discovery of gravitational waves and their connection to GRBs warrant a high precision GRB polarimeter capable of both providing high precision polarization measurements as well as detecting very weak GRBs.

The POLAR-2 polarimeter, based on the same Compton scattering measurement principle as POLAR, but with an extended energy range and an order of magnitude larger overall effective area for polarization events. The instrument, proposed and being developed by a Swiss, Chinese, Polish and German collaboration, has been selected to be installed on the China Space Station, and scheduled to be launched within the next few years

In this talk the science objectives, the instrument design considerations, the payload development status, and the expected science performance will be presented.

Primary author: WU, Xin (University of Geneva, Switzerland)

Presenter: WU, Xin (University of Geneva, Switzerland)