

A small mission featuring an imaging x-ray polarimeter with high sensitivity

SPIE Conference: UV, X-Ray, and Gamma-Ray Space Instrumentation for Astronomy XVIII, Aug 25-29, San Diego, California.

Dr. Martin C. Weisskopf, Dr. Luca Baldini, Dr. Ronaldo Bellazini, Dr. Alessandro Brez, Prof. Enrico Costa, Dr. Richard Dissly, Dr. Ronald Elsner, Dr. Sergio Fabiani, Prof. Giorgio Matt, Dr. Massimo Minuti, Dr. Fabio Mulieri, Dr. Steve O'Dell, Dr. Michelle Pinchera, Dr. Brian Ramsey, Dr. Alda Rubini, Dr. Carmelo Sgro, Dr. Paolo Soffitta, Dr. Gloria Spandre

Abstract

We present a detailed description of a small mission capable of obtaining high precision and meaningful measurement of the X-ray polarization of a variety of different classes of cosmic X-ray sources. Compared to other ideas that have been suggested this experiment has demonstrated in the laboratory a number of extremely important features relevant to the ultimate selection of such a mission by a funding agency. The most important of these questions are: 1) Have you demonstrated the sensitivity to a polarized beam at the energies of interest (i.e. the energies which represent the majority (not the minority) of detected photons from the X-ray source of interest? 2) Have you demonstrated that the device's sensitivity to an unpolarized beam is really negligible and/or quantified the impact of any systematic effects upon actual measurements? We present our answers to these questions backed up by laboratory measurements and give an overview of the mission.