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Crystal Eye

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From recent observations it became clear that medium-low energy (i.e. ~keV-MeV) gamma-rays are powerful probes for the extreme Universe. Nevertheless this energy range is still underexplored. For this reason it is necessary to design new detectors optimized for the medium-low energy range. One of the proposed novel detection techniques is the one adopted by Crystal Eye. Crystal Eye is a new all-sky monitor using an up-to-date technology that includes a wide Field Of View, a good sky localization capability and a large effective area. This detector has a configuration which allows it to catch gamma-rays from 10 keV to 30 MeV.

Today the research group is working at several levels to this application: a Crystal Eye prototype for the Space Rider mission, the Crystal Eye full scale detector design and the use of the Crystal Eye detection technique in the calorimeter of the Zirè payload for the NUSES mission. For a Crystal Eye prototype LYSO crystals from different manufactures and with different treatment of the surfaces were used.

In this talk, I will present the characterization and test of several scintillators. These tests provide indications to fix some parameters of Crystal Eye to optimize its design. I will present simulation results for the prototype background mission and full detector, focusing on the effective area and sensitivity.

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