

Under The Background Influence (UTBI)

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UTBI is an ESA Students project with the aim of radiation measurement on board the International Space Station (ISS). The project was presented, in the scope of the “SUCCESS Student Contest/Special Opportunities” and was selected for implementation onboard the ISS during ESA’s Long Duration Mission

The instrument is based on a COST Semi-Insulating (SI) Cadmium Zinc Telluride (CdZnTe) detector grown by the High-Pressure Electro-Dynamic Gradient (HP-EDG) technique. The crystal volume is $15 \times 15 \times 7.5 \text{ mm}^3$ and with a Co-Planar Grid (CPG) electrode configuration. The Analog Front End Electronics (AFEE) is integrated in a commercial ASIC for noise reduction purpose and designed for a large energy range (30 KeV-8 MeV).

The instrument electronics are designed with COST electronic components and with the ESA contest maximum restrictions of 1 kg mass, $20 \times 20 \times 20 \text{ cm}^3$ volume, ISS electromagnetic compatible and no telemetry capability.

The main scientific goal for the instrument is to achieve nuclear-radiation spectroscopy by the bi-parametric technique data analysis for radiation identification. Previous work has been performed in two ways: on one hand simulations (SPENVIS, CREME96, GEANT4, SRIM, EFS) proving the viability of the mission and on the other hand experimental laboratory measurements and data analysis for gamma ray sources (Co57, Cd109, Cs137).

Launch of the experiment is foreseen in the October 2006 timeframe and planned for 8 days data collection on board the ISS.