

SPACE SYSTEMS SYMPOSIUM (D1)
Enabling Technologies for Space Systems (2)

Author: Dr. Conny Hansson
The Netherlands, conny.hansson@esa.int

Mr. Alan Owens
The Netherlands, alan.owens@esa.int
Mr. John v.d. Biezen
The Netherlands, Johannes.Biezen@esa.int

X-RAY, GAMMA-RAY AND NEUTRON DETECTOR DEVELOPMENT FOR FUTURE SPACE
INSTRUMENTATION.

Abstract

The evermore stringent requirements with respect to performance of detector technology in harsh environments while at the same time reducing their overall drain on space craft resources without loss in performance is a trend that has been observed for the last few decades within the space instrumentation field. To meet these requirements for future space missions ESA is perusing development of new, targeted materials for use as X-ray, -ray and neutron detection media. For the medium to hard X-ray range wide bandgap compound semiconductors (CdZnTe, TlBr), offering the potential of fano limited performance under room temperature operation conditions, are being investigated. High resolution scintillators (CeBr₃, SrI₂), offering the excellent spectroscopic performance of LaBr₃ with lower noise levels, are being developed. A solid state neutron detector using a B compound, making available a high refractory replacement for the ever scarcer He³ alternative, is also being manufactured for space based neutron detection. In this paper the underlying need for development of new targeted materials, the rational behind the selected materials and the most current results obtained from these detector development programmes will be discussed