



Contribution ID: 53

Type: **Poster Presentation**

Influence of edge surface leakage current on the performance of pixelated CdTe radiation detectors

Wednesday, September 10, 2014 2:00 PM (1h 40m)

Small pixel CdTe radiation detectors provide excellent spatial and energy resolution for spectroscopic X-ray imaging. The high leakage current of CdTe, originated by its bulk and lateral edges, limits the performance of CdTe at high bias potentials. Guard bands are used to prevent interference of edge leakage current with the radiation signal. In the production of large flat panel CdTe radiation detectors through the tiling of CdTe modules, guard bands need to be minimised or removed to increase the active detection area. This paper will characterise the edge leakage current and its consequences on spectroscopy acquired with small pixel CdTe detectors in order to build successful large flat panel CdTe detectors.

The contribution of edge leakage current has been separated from the total leakage current. Its dependence on time, temperature and bias will be investigated. Measurements will be presented for twenty Schottky CdTe detectors with a pixel pitch of 250 μm . In these detectors it has been found that the edge leakage current density is consistently higher than the bulk leakage current density and is responsible for the detector breakdown at high voltages.

The cause of high edge leakage current and its localised character will be presented and the effects of high leakage currents on small pixel spectroscopy discussed.

Primary author: DUARTE, Diana (S)

Co-authors: Dr SCHNEIDER, Andreas (STFC Rutherford Appleton Laboratory); LIPP, John (Science and Technology Facilities Council); Dr BAKER, Mark (University of Surrey); VEALE, Matthew (STFC Rutherford Appleton Laboratory); WILSON, Matthew (STFC); SELLER, Paul (RAL); SELLIN, Paul (University of Surrey); Mr BELL, Steven (STFC Rutherford Appleton Laboratory, University of Surrey)

Presenter: DUARTE, Diana (S)

Session Classification: Session 10: Posters 1 (Particle Physics, Pixel Detectors and Lifesciences)

Track Classification: Advances in Pixel Detectors and Integration Technologies