

Application of the Medipix2 Technology to Space Radiation Dosimetry and Hadron Therapy Beam Monitoring

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The Medipix2 Collaboration, based at CERN, has developed the TimePix version of the Medipix pixel readout chip, which has the ability to provide either an ADC or TDC capability separately in each of its 256 x 256 pixels. When coupled to a Si detector layer, the device is an excellent candidate for application as an active dosimeter for use in Space Radiation Environments. In order to facilitate such a development, data have been taken with Heavy Ions at the HIMAC facility in Chiba, Japan. In particular, the problem of determining the resolution of such a detector system with respect to heavy ions of differing charges and energies, but with similar dE/dx values has been explored for several ions. The ultimate problem is to parse the information in the pixel "footprint" images from the drift of the charge cloud produced in the detector layer. In addition, with the use of convertor materials, the detector can be used as a neutron detector, and it has been used both as a charged particle and neutron detector to evaluate the detailed properties of the radiation fields produced by hadron therapy beams. New versions of the basic chip design are ongoing.

Summary (Additional text describing your work. Can be pasted here or give an URL to a PDF document):

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Author: Prof. PINSKY, Lawrence (University of Houston-Physics Dept.-Houston, Texas USA)

Co-authors: Prof. LEROY, Claude (University of Montreal, Montreal, Canada); Ms ANDREA, Gutierrez (University of Montreal, Montreal, Canada); Dr JAKUBEK, Jan (CTU, Prague, Czech Republic); Mr STOFFLE, Nicholas (University of Houston-Physics Dept.-Houston, Texas USA); Prof. POSPISIL, Stanislav (CTU, Prague, Czech Republic); Dr NAKAHIRO, Yasuda (HIMAC, National Institute for Radiological Sciences, Chiba, Japan); Dr UCHIHORI, Yukio (HIMAC, National Institute for Radiological Sciences, Chiba, Japan)

Presenter: Prof. PINSKY, Lawrence (University of Houston-Physics Dept.-Houston, Texas USA)

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