Contribution ID: **127**   Type: **Poster**

The Pixel Detector Readout ASIC for the Micro Vertex Detector of the PANDA Experiment

Wednesday, 23 May 2012 11:26 (0 minutes)

The PANDA experiment at the future FAIR facility under construction
near the GSI research center at Darmstadt, Germany, aims to the study
of the antiproton-proton and antiproton-nucleus annihilation
reactions.
The Micro Vertex Detector (MVD) is the innermost part of the experiment
and will consist of silicon pixel and silicon strip detectors. Owing to the
high track density (up to 11.4 MHz/cm^2) and the absence of an hardware trigger
signal, an ASIC based custom solution for the electronic readout of the pixel
detector has been chosen. The ASIC, named ToPiX, will provide the time
position of each hit and a measure of the charge released with the Time over
Threshold (ToT) technique.
A reduced scale prototype in a CMOS 0.13 μm technology has been designed and
tested. The prototype includes four columns made of 128 pixel cells, four columns
of 32 cells and and the end of column readout with a 32 cells deep FIFO for each
double column. Each cell embeds a charge amplifier with constant current feedback
capacitor discharge, a comparator with per cell adjustable threshold, 12-bits
leading and trailing edge register for time and ToT measurement and an 8 bits
bit configuration register. All the readout logic has been SEU-hardened by design
using either Hamming encoding or triple redundancy.
The chip has been tested both electrically via a test pulse input and connected
to a detector in a beam test. Radiation test for both TID and SEU tests have been
performed.

Primary authors: RIVETTI, Angelo (INFN sez. di Torino); CALVO, Daniela (INFN sez. di Torino); MAZZA, Giovanni (INFN sez. di Torino); TOSCANO, Luca (INFN sez. di Torino); MIGNONE, Marco (INFN sez. di Torino); DE REMIGIS, Paolo (INFN sez. di Torino); WHEADON, Richard (INFN sez. di Torino); KUGATHASAN, Thanushan (Universitaʻ di Torino e INFN sez. di Torino)

Presenter: CALVO, Daniela (INFN - Torino)

Session Classification: Front End, Trigger, DAQ and Data Management - Poster Session

Track Classification: P4 - Front End, Trigger, DAQ and Data Management