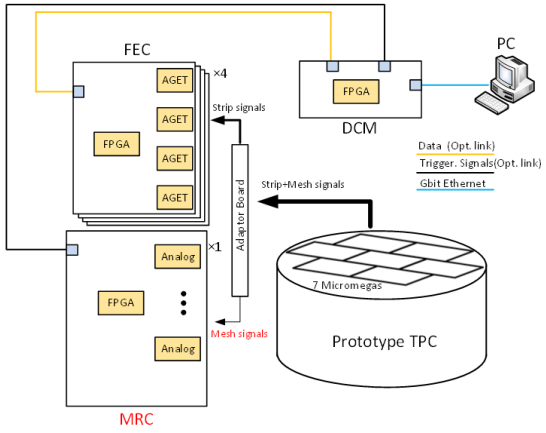
Design of Mesh-signal Readout Electronics for PandaX-III Prototype TPC

Zhen Chen



MRC acquire all mesh signals and generates individual ‘Mesh-trigger’ signals

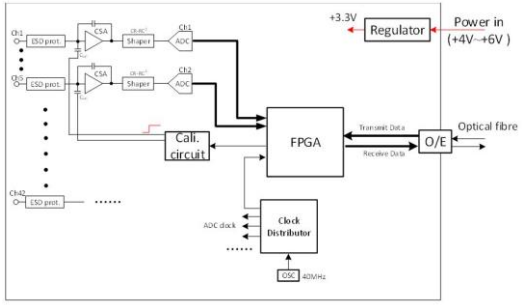
MRC sends trigger signals to DCM

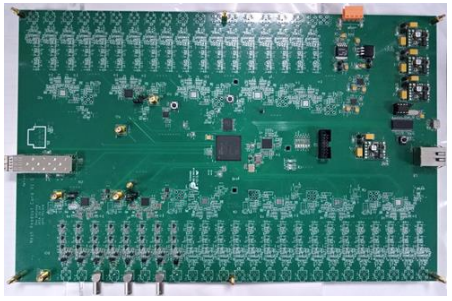
The trigger signals will be distributed to 4 FECs

Requirement:
INL≤ 3.2%, RMS noise≤ 6 fC with 10 pC range

Design:
41 analog channels
11 quad, 12-bit, 50MSPS, serial, LVDS A/D
1 FPGA

Test:
8 input channels with 2 ADCs has been welded now





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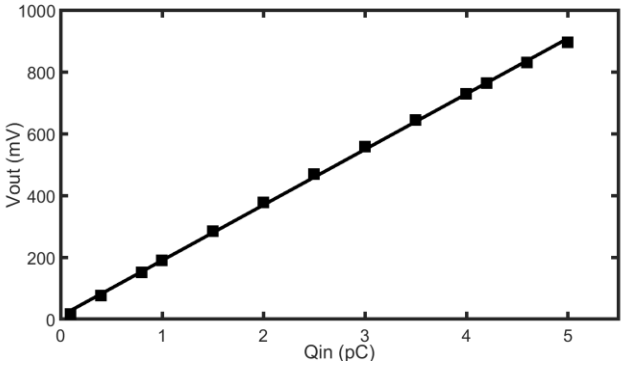
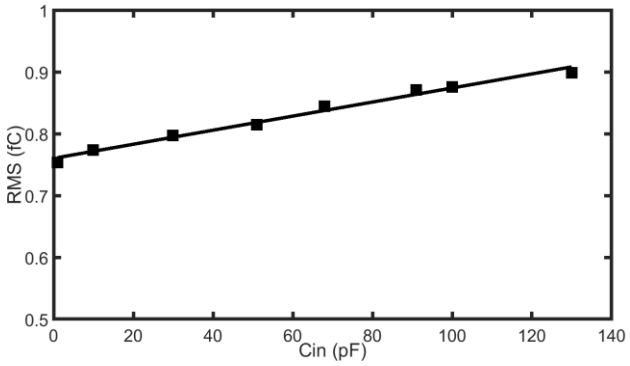
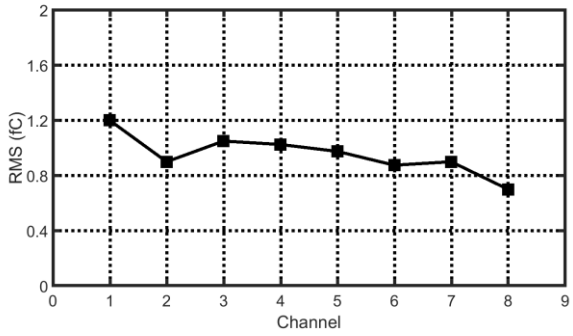


INL<3% with 5.5pC



Noise (RMS) vs capacitor value <0.9fC with 100pF



Noise distribution of 8 channel <1.25fC with 1μs peaking time with 5.5pC

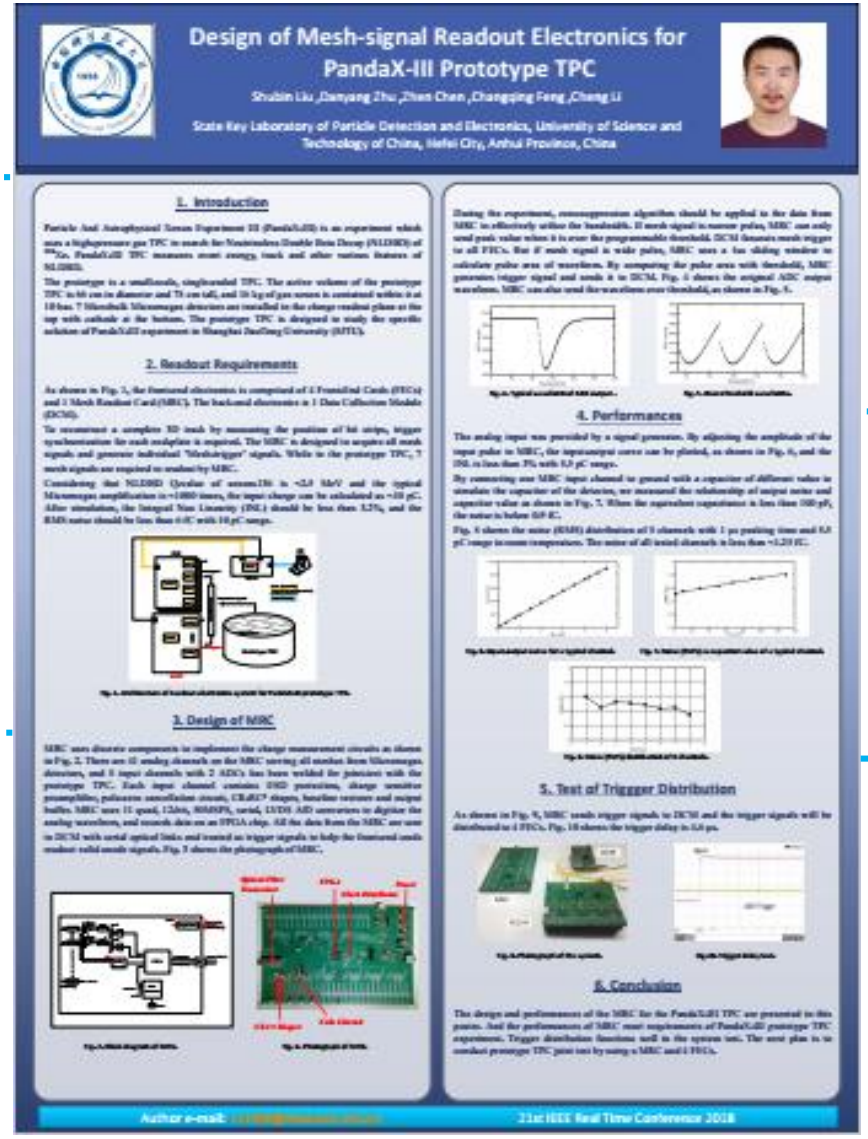
Poster

Poster session 2,
Abstract ID 457
14/06/2018, 14 : 35

Introduction

Description of Readout electronics

Description of MRC



Performances