EUDET MEETING
Paris
October 8-10, 2007

Tile-MGPD System for EUDET Module

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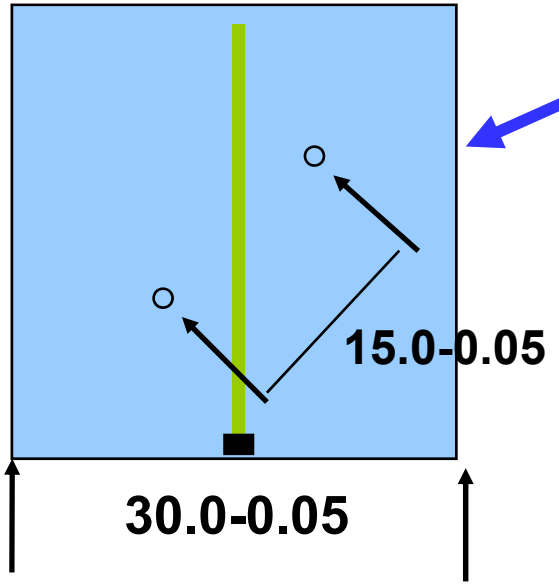
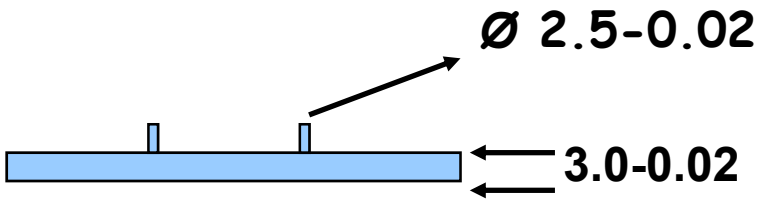
All dimensions are preliminary

TILE

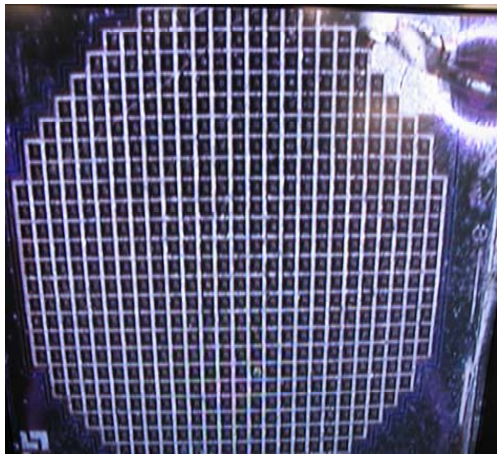
Chemically treated edges for light reflection

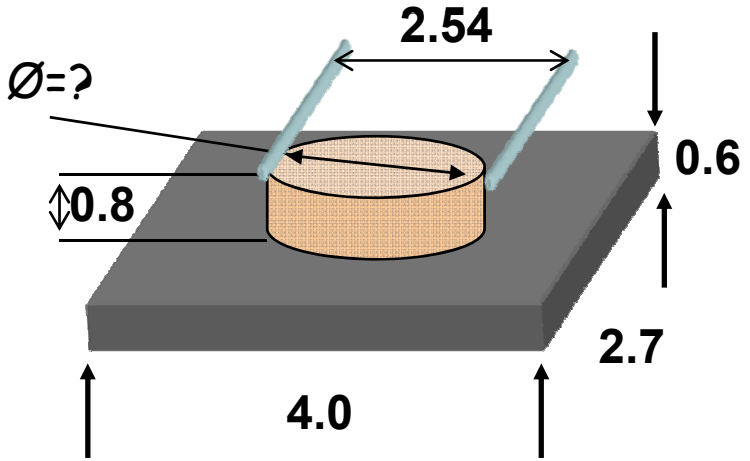




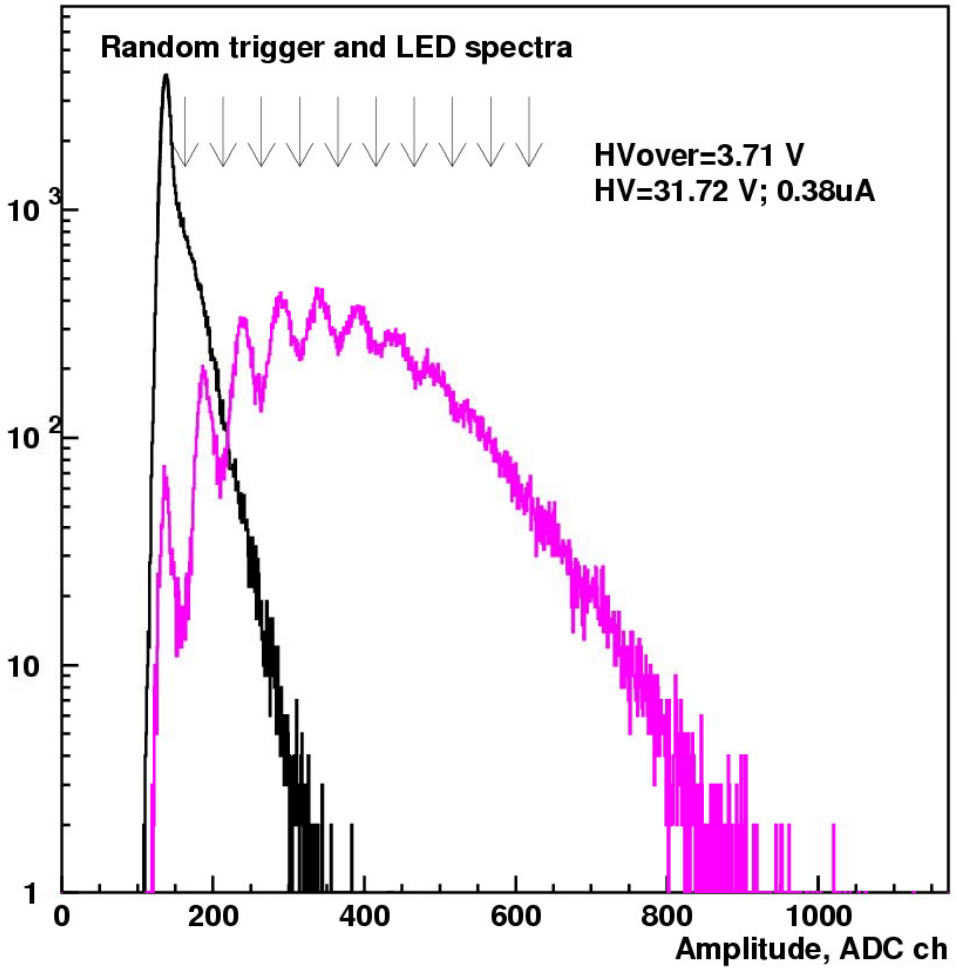
MGPD

556 cells, Ø1mm
CPTA, Moscow

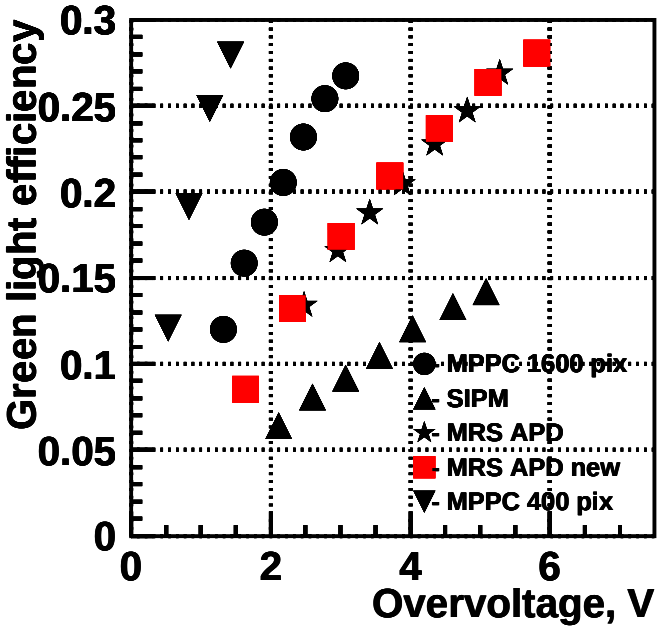


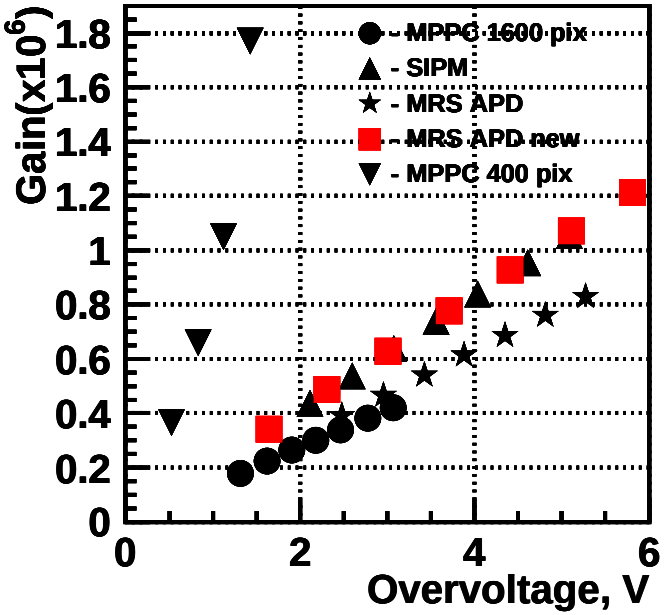


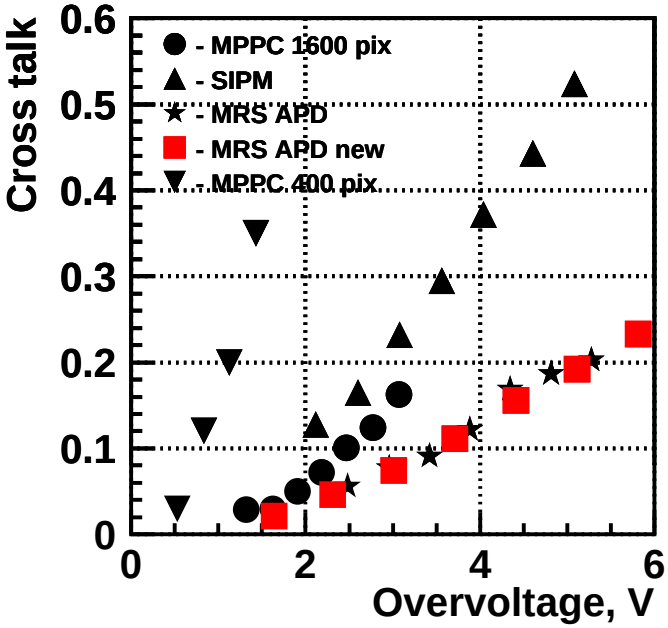
LED and Noise spectra from 30x30x3mm Tile with a new CPTA MGPD

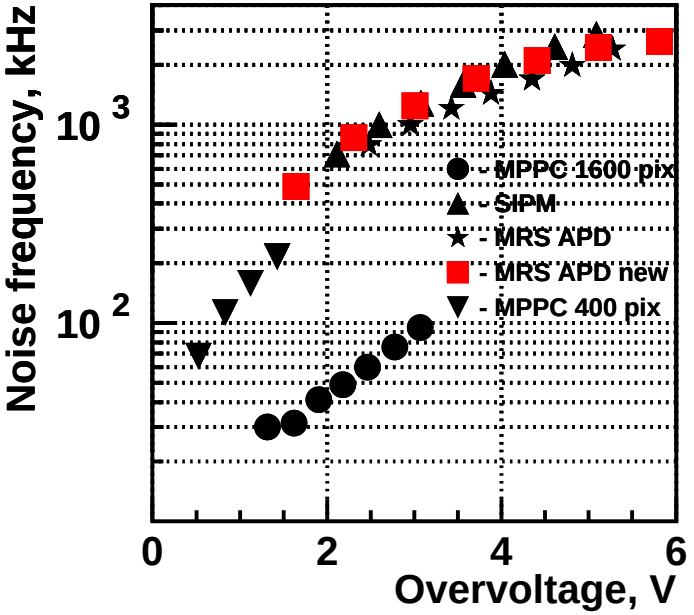


MGPD PROPERTIES



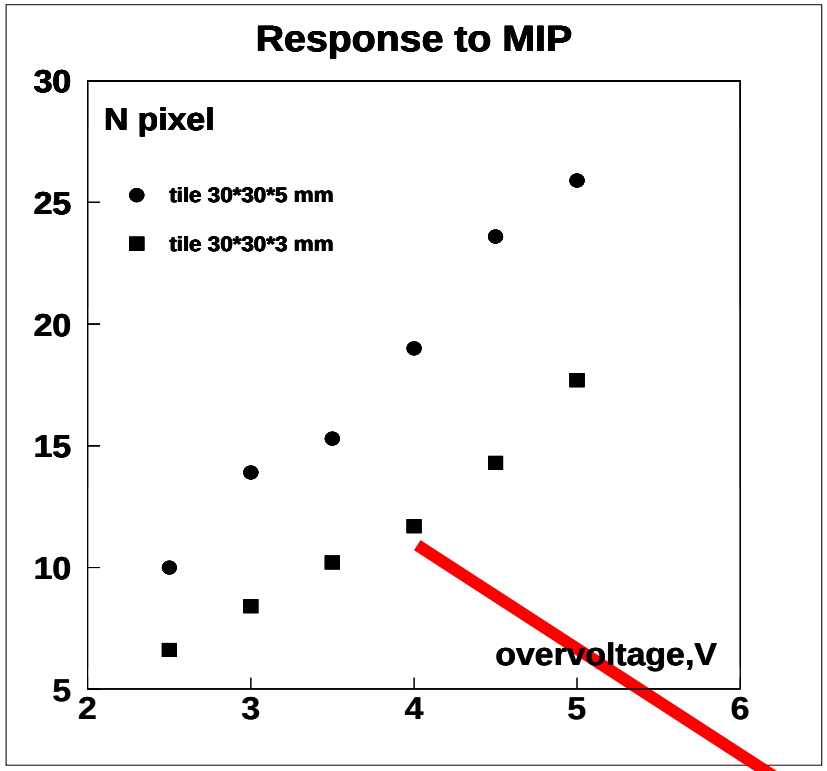


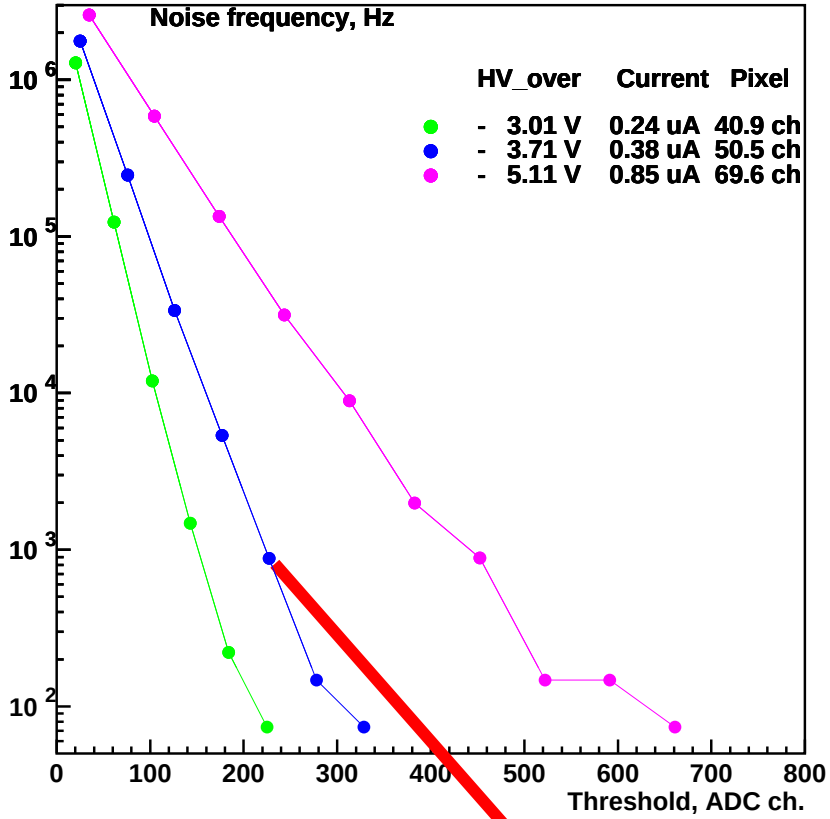




CPTA MGPD noise and response to MIP in 30·30 ·3 mm^3 tile

Tille measurement conditions.
Groove: through the center parallel to tile edge, 1.9 mm depth;
Tile: white edges, 3M on top and bottom;
WLS: Y11, 1 mm Ø without glue, 3M mirror at far end;
Source: triggered beta source (Sr 90) – similar to MIP



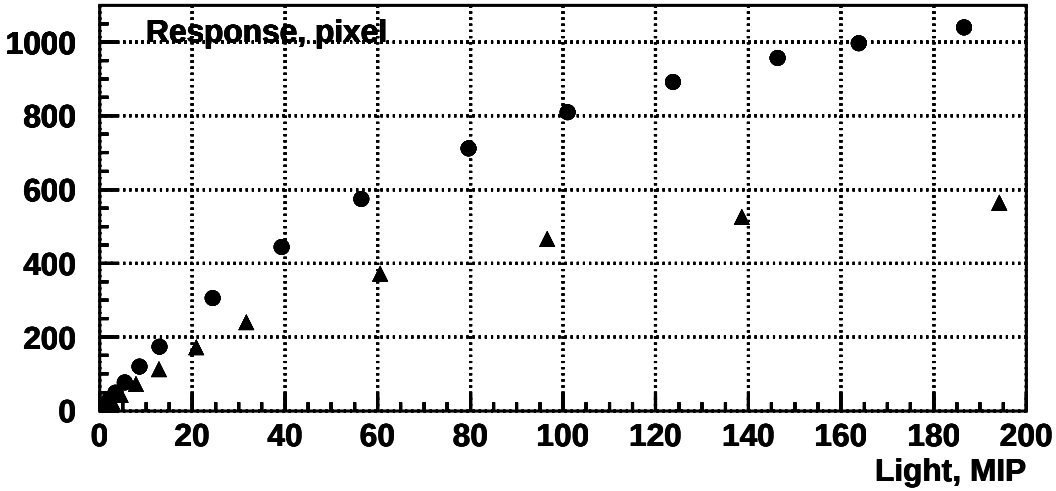


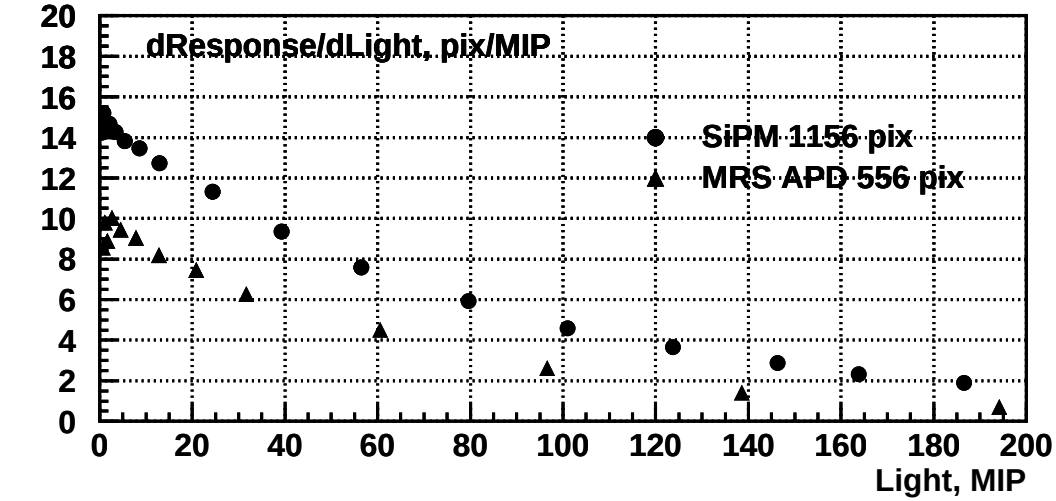
Possible scenario.

Light yield from 3mm thick tile = 11 pixel → overvoltage = 4.0 V →noise=900Hz at 4.5 p.e. threshold (98% efficiency) or 150 Hz at 5.5 p.e. threshold (96%)

What about dynamic range?

CPTA MGPD has only 556 pixels





The situation will become better with increase of MGPD area from 1 to 1.44 mm^2 and WLS diameter from 1 to 1.2 mm

This leads to:

Extension of dynamic range by 1.44
Increased light yield ,
Decreased HV for same # pixels and hence lower noise

Preliminary Schedule

Dec. 2007 – 100 tiles without grooves for tolerance studies

Jan 2008 - first tiles with MGPDs and with machined grooves

Mid 2008 – 200 completely injection molded tiles with MGPDs

Beginning 2009 – 1-2 thousand tiles

Work on direct MGPD coupling in parallel