

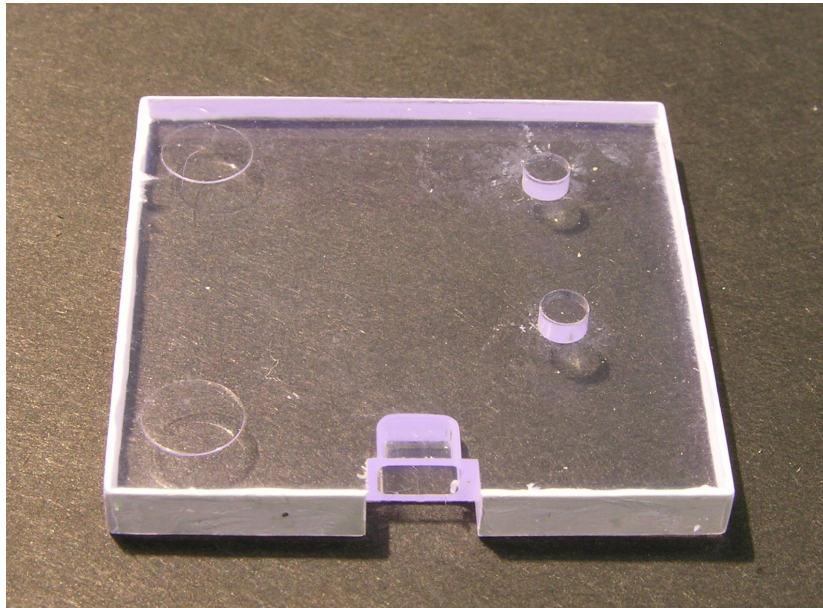
**CALICe Meeting
Hamburg University
20-22.03.13**

Tile&SiPM activities at ITEP

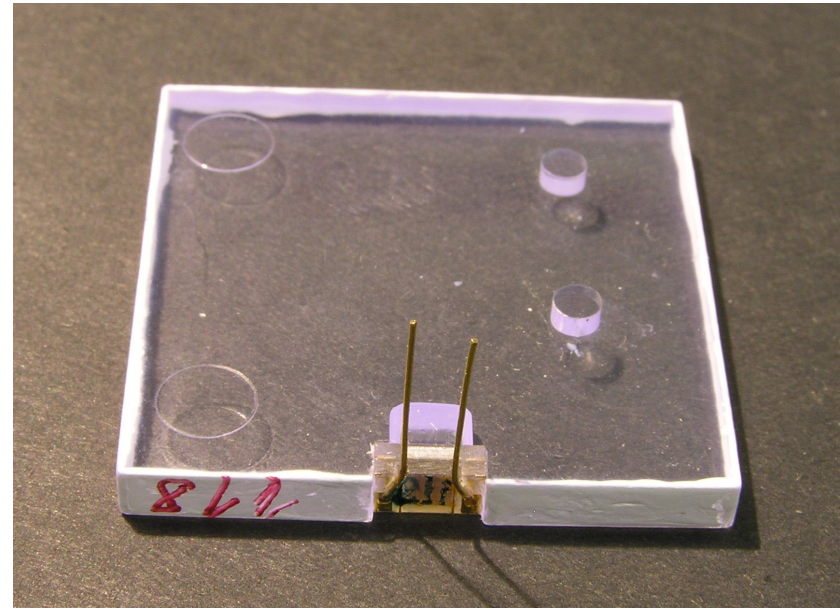
M.Danilov

Production of tiles for direct readout with KETEK SiPM

Picture of a tile w/o SiPM
with mated edges

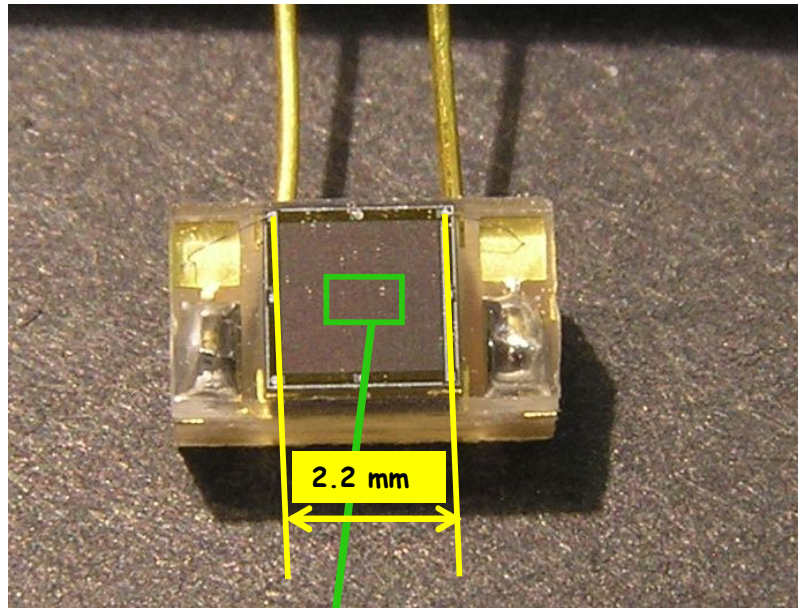


Picture of a tile with SiPM



molded tile with dimple for direct readout

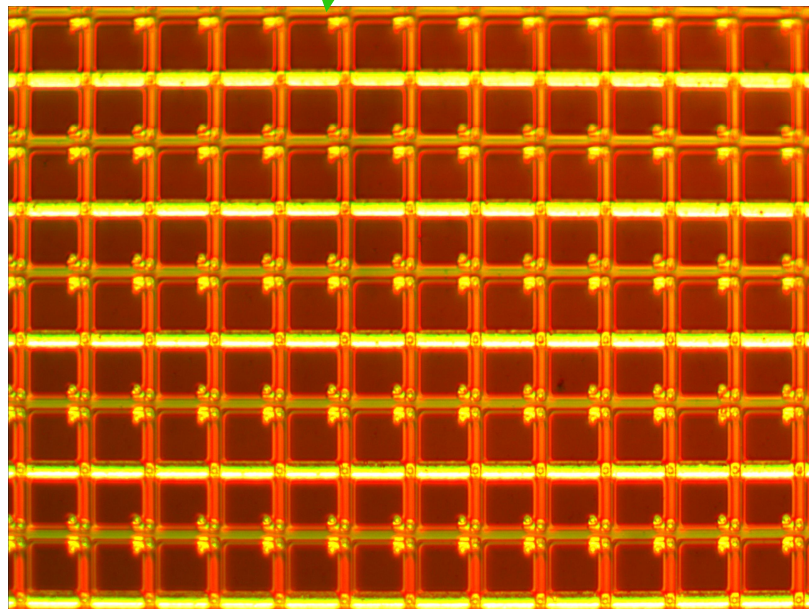
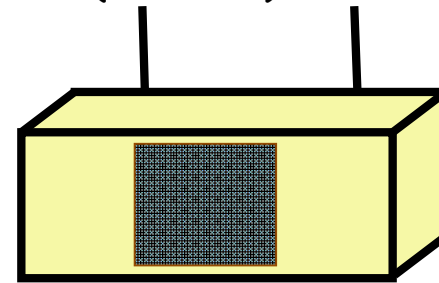
KETEK SiPM



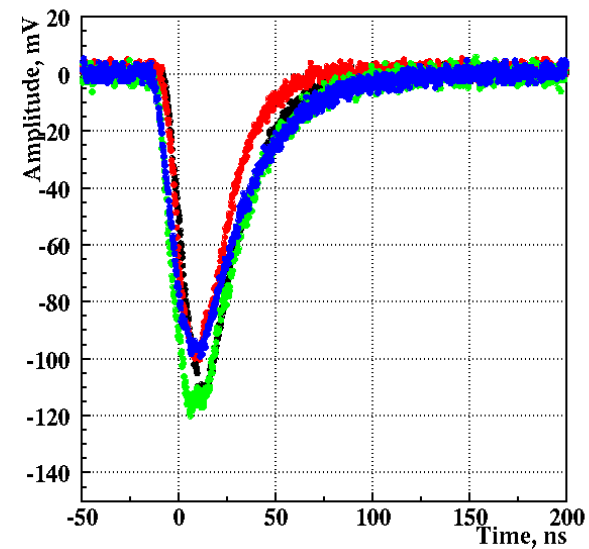
Sensitive area - $2.2 \times 2.2 \text{ mm}^2$

Pitch - 20μ --> 12100 pixels

Package size (LxHxD) - $5.4 \times 2.9 \times 2.0 \text{ mm}^3$

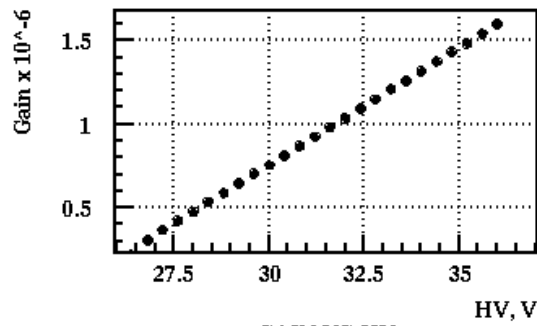


Response to LED flash w/o amp

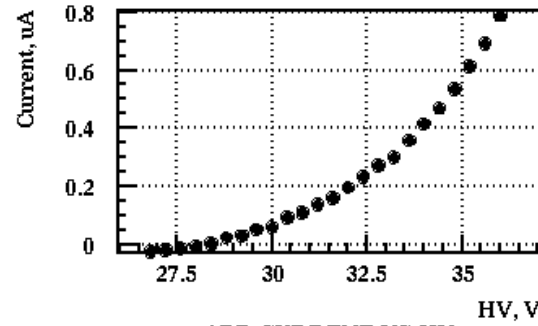


Parameters of a KETEK SiPM measured with blue LED

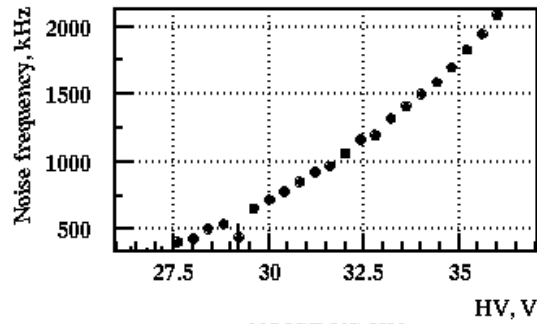
Breakdown HV ~ 24.6 V
 Operation voltage - 32.5 V



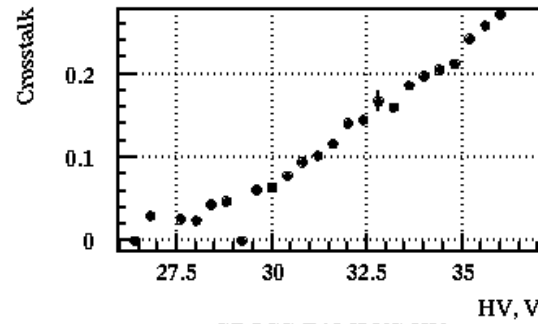
GAIN VS HV



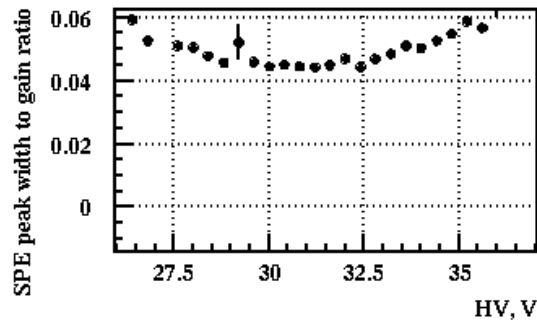
APD CURRENT VS HV



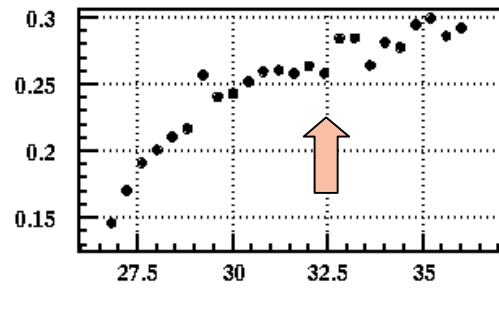
NOISE VS HV



CROSS TALK VS HV

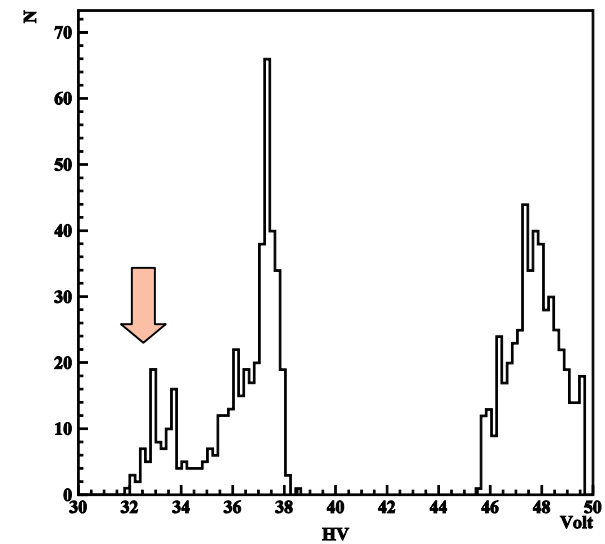


PEAK WIDTH VS HV



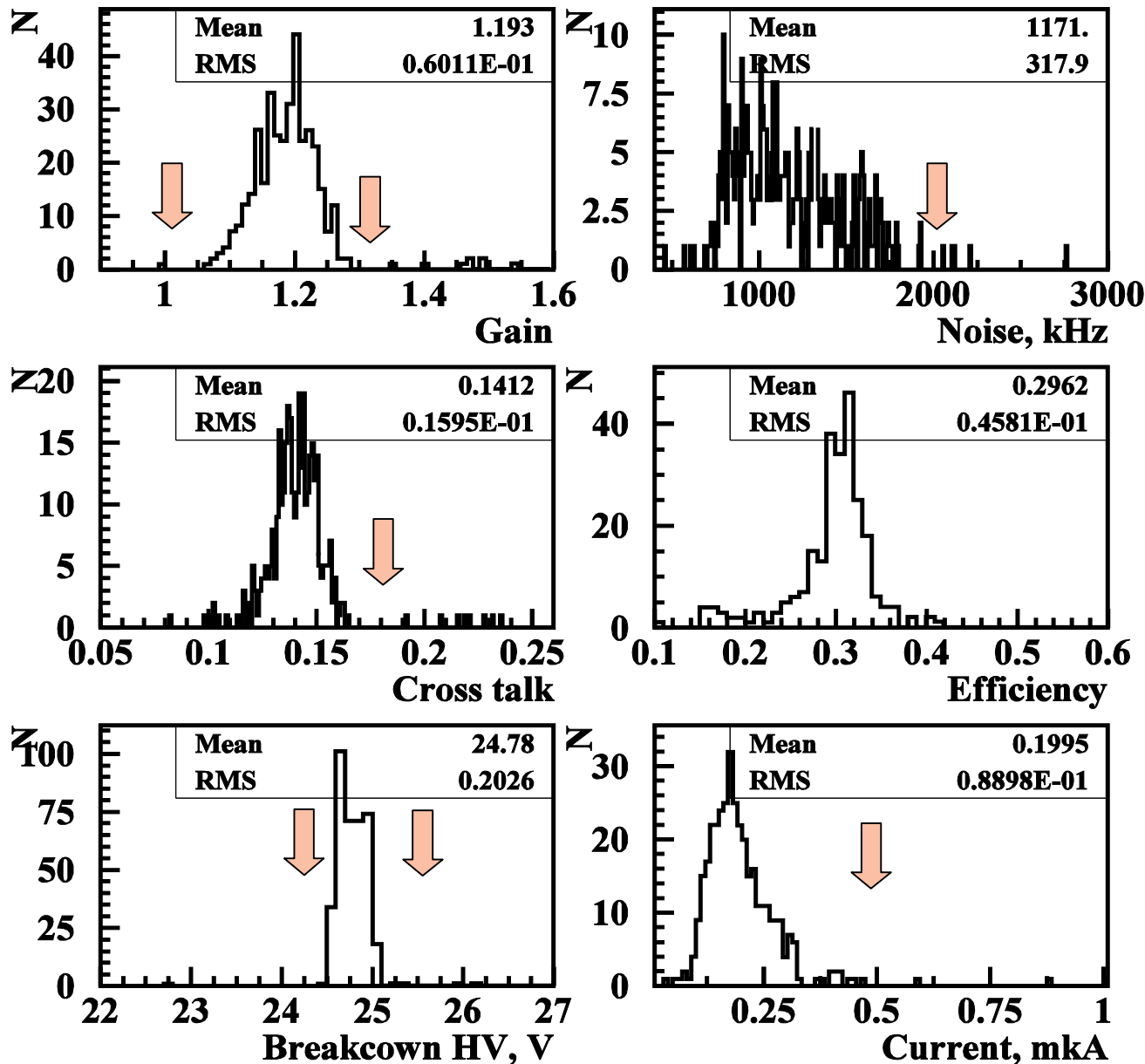
EFFICIENCY PER PHOTON VS HV

Voltage distribution for tiles already sent to DESY



Due to high operating overvoltage week dependence on temperature!

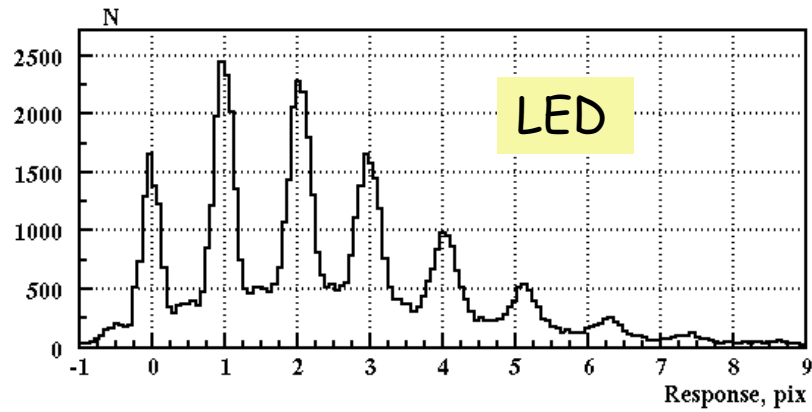
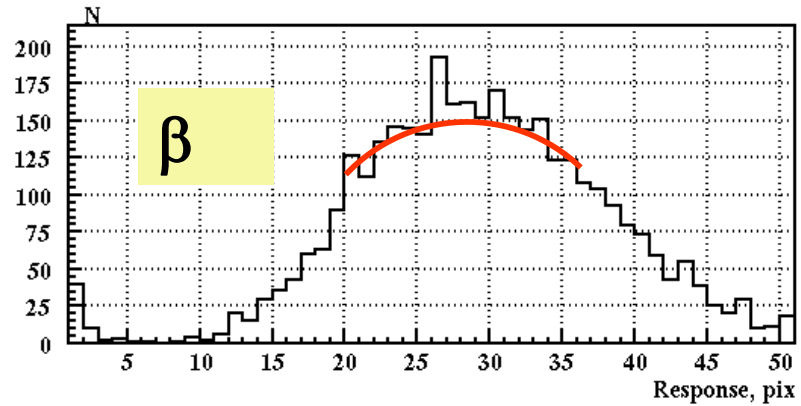
Parameters of 380 SiPM's at chosen voltage (32.5 V)



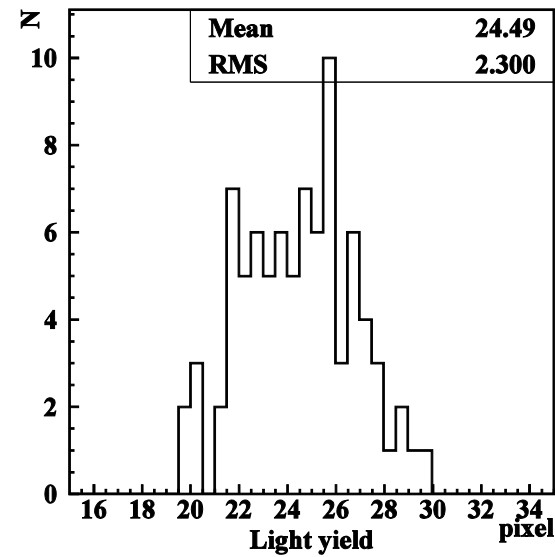
Arrows show position of selection cuts

$1 \cdot 10^6 < \text{Gain} < 1.3 \cdot 10^6$
 $F_{\text{noise}} < 2 \text{ MHz}$
 $\text{Cross talk} < 0.18$
 $24.2 \text{ V} < \text{HV}_{\text{bd}} < 25.5 \text{ V}$
 $\text{Current} < 0.5 \mu\text{A}$

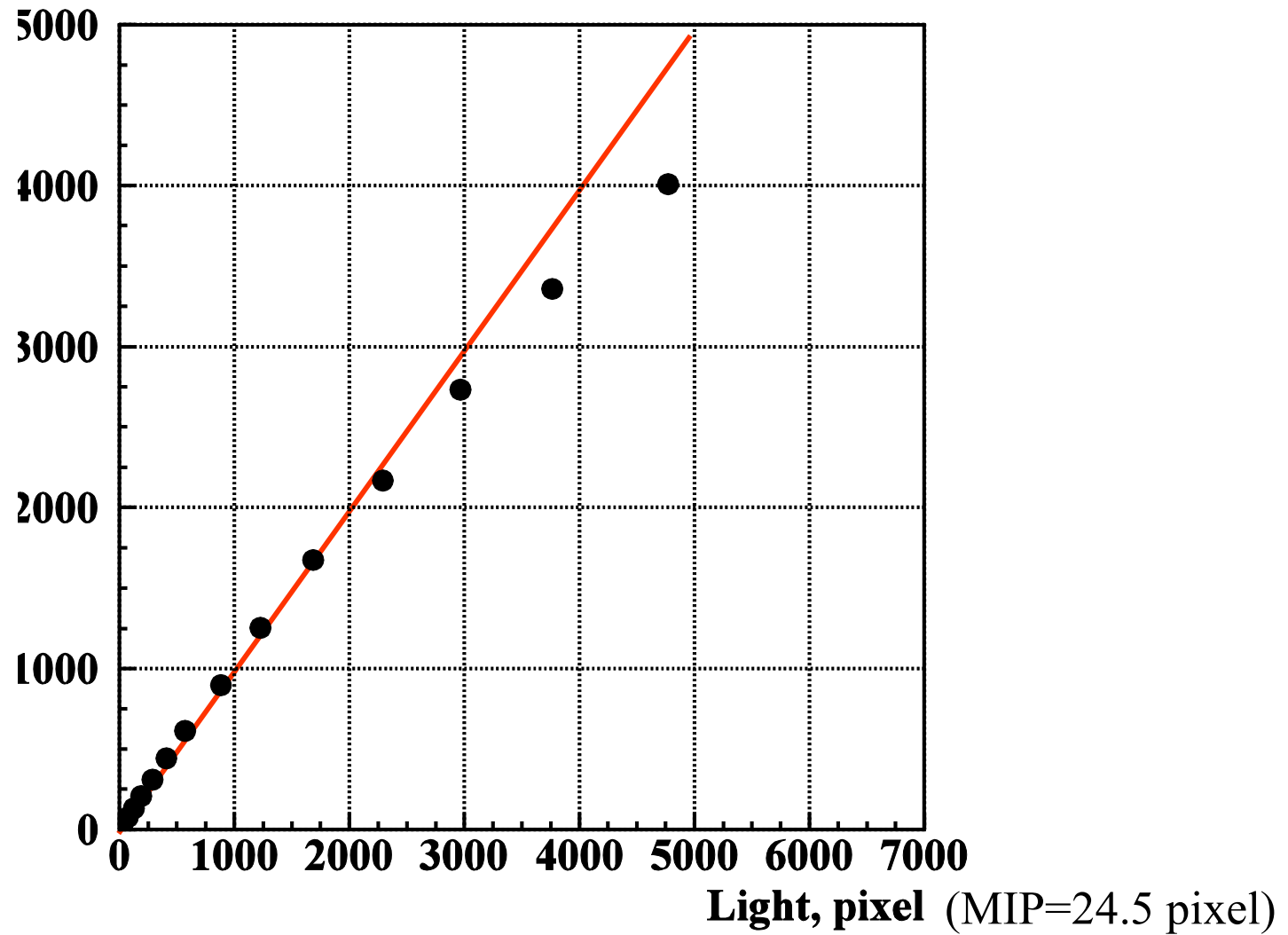
Response of a tile with KETEK SiPM to β -particle from ^{90}Sr



Distribution of MPV for tile response



Saturation curve of 12100 pixel SiPM



Summary

We have produced and tested 300 Tile&SiPM systems with direct readout for 2 HBU