

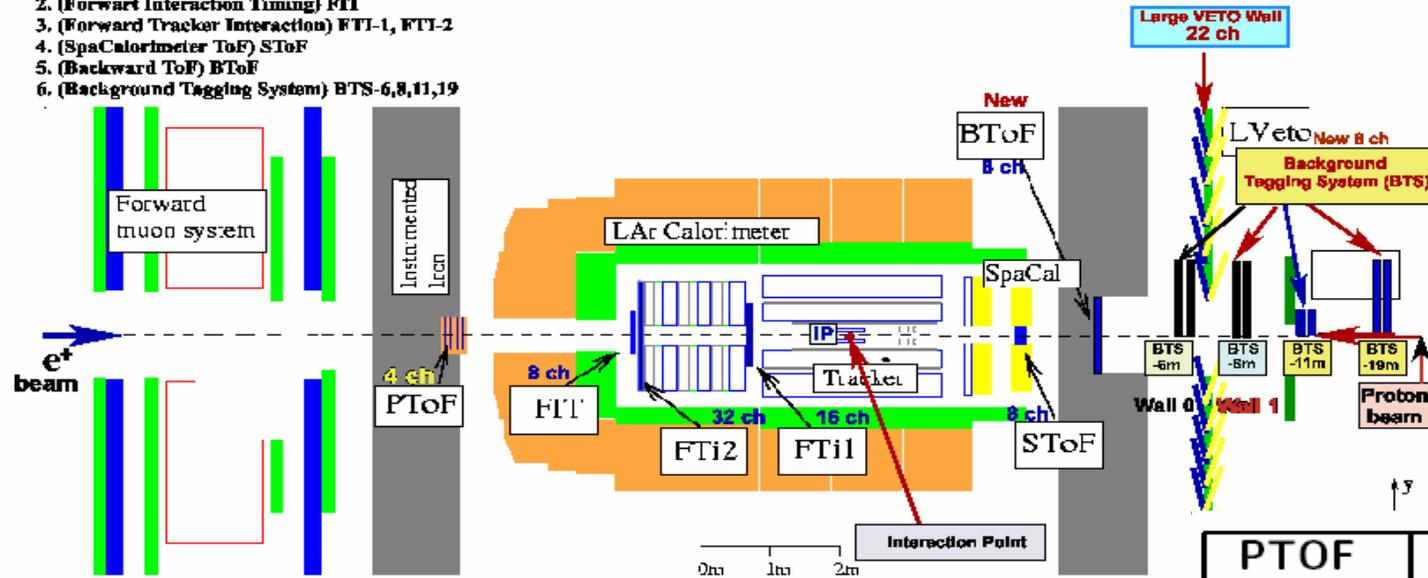
# ToF / VETO

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 Technical plenary  
 22.02.2006

## H1 Time-of-Flight (ToF) & VETO/BTS System

### ToF SubSys Names:

1. (PLUG) PToF
2. (Forward Interaction Timing) FIT
3. (Forward Tracker Interaction) FTI-1, FTI-2
4. (SpaCalorimeter ToF) SToF
5. (Backward ToF) BToF
6. (Background Tagging System) BTS-6,8,11,19



PToF	5.3m	4 channels
FIT	2.7m	8 channels
FTI2	2.5m	32 channels
BSToF	-0.3m	8 channels
SToF	-2.5m	8 channels
BToF	-3.3m	4 channels
LVETO	-6.5m	22 channels
BTS	6m	2 channels
BTS	8m	2 channels
BTS	11m	2 channels
BTS	19m	2 channels

- Nothing essential new on the TOF detectors (PToF, SToF, FIT, FTI2) - all are fine, no changes during shutdown
- BSToF (rad.monitor) retired to give place for BST
- Essential shutdown work on VETO system

## BSToF

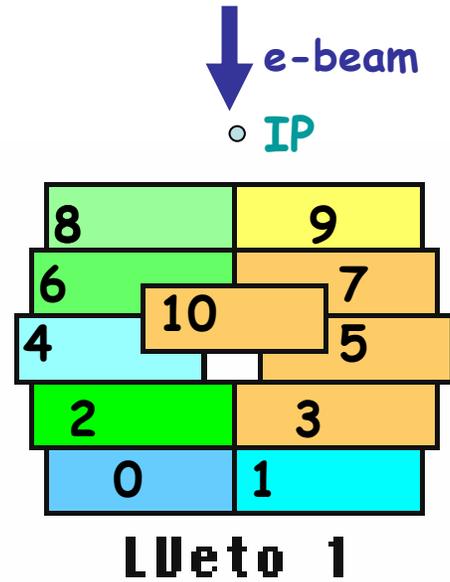
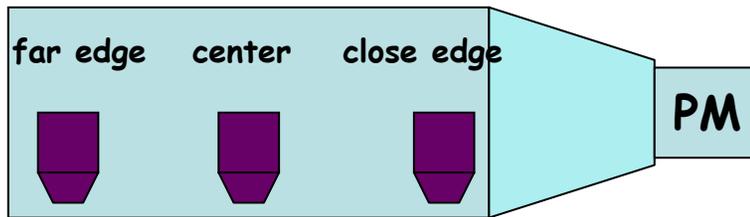


# Large VETO walls (2\*11 scintillators, 175x80 cm<sup>2</sup> and 210x90 cm<sup>2</sup>)

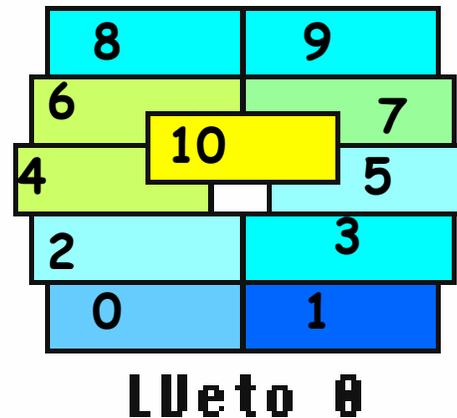
## Efficiency study with cosmics:

Use two small (20 x 15 cm<sup>2</sup>) scintillating counters to estimate efficiency as ratio of coincidences between these counters and one VETO counter to coincidences between these counters.

Measurement is done individually for each of 22 VETO counter, for different HV settings, and at different positions on VETO counter

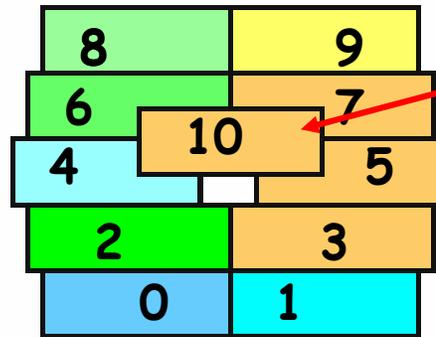


5cm Fe



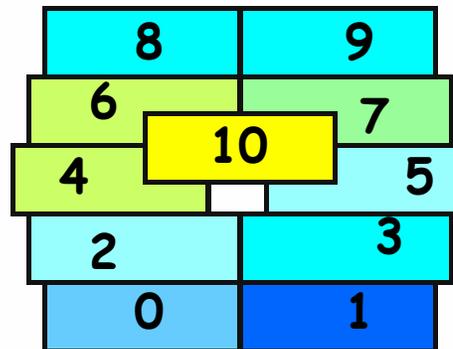
## Results:

- many PM's need HV values close to their limits
- 7 counters show very low efficiency (these are the counters which are mainly affected by synchrotron radiation).



Most hit by synchr. radiation

LUeto 1



LUeto 0

# Single (cosmic) particle detection efficiency vs HV

Eff (%)

**VETO 1-10 (similar for 7 other counters)**

100%

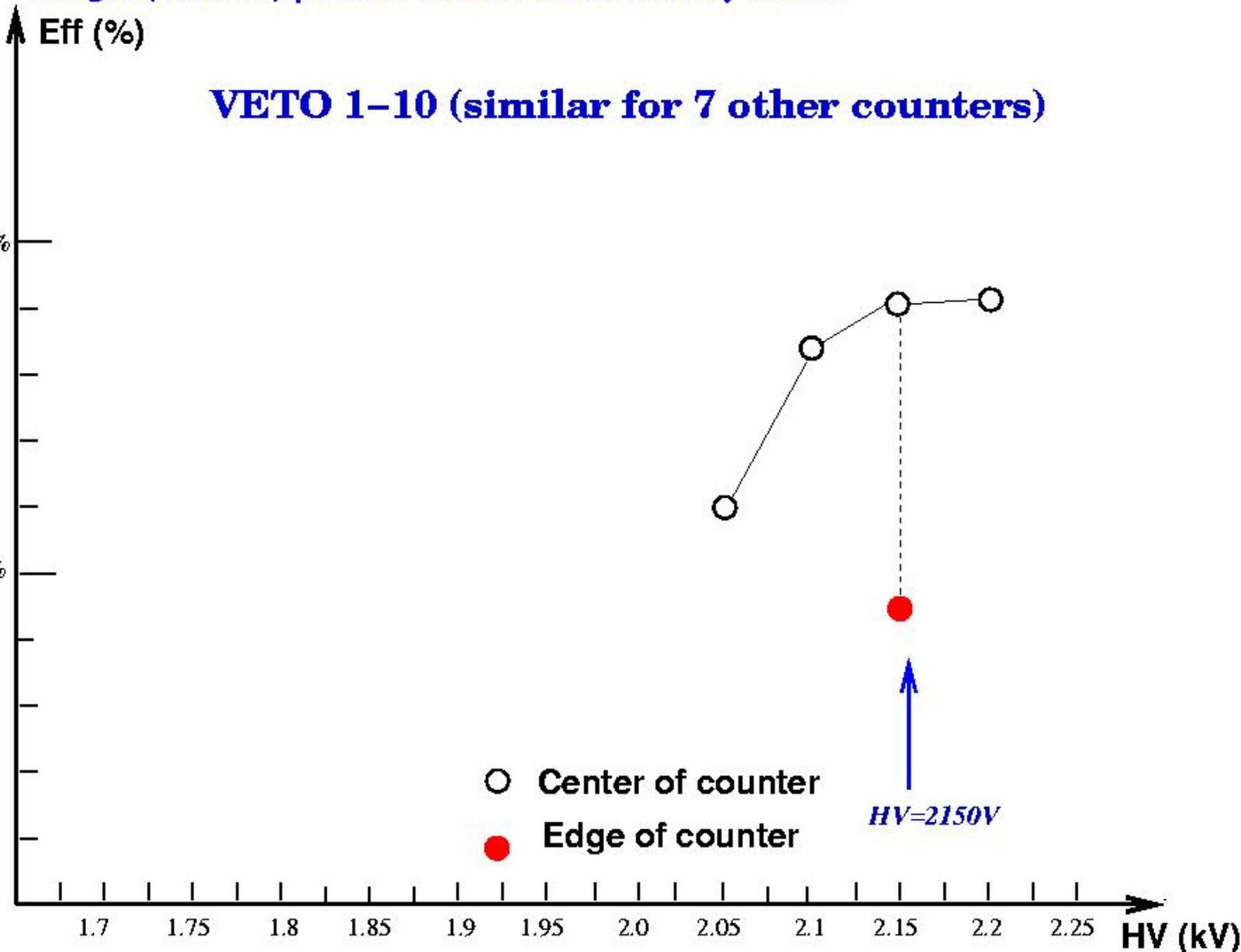
50%

○ Center of counter

● Edge of counter

*HV=2150V*

1.7 1.75 1.8 1.85 1.9 1.95 2.0 2.05 2.1 2.15 2.2 2.25 HV (kV)

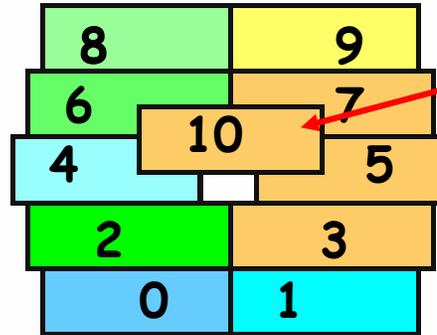


## Results:

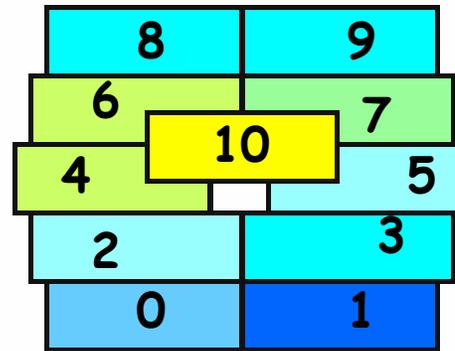
- many PM's need HV values close to their limits
- 7 counters show very low efficiency (these are the counters which are mainly affected by synchrotron radiation).

- Luckily we found 8 new, spare scintillators with PM's in PETRA hall
- They were transported to North Hall (thanks to Karsten Gadow) during Christmas time, so we could make complete check
- one of those was broken during transportation, but 7 counters show very good efficiency

Finally decided to replace all 7 bad scintillators. Rather difficult crane work, but Karsten and his crew managed it !



LUeto 1



LUeto 0

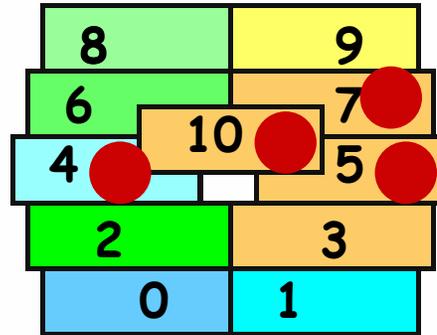
Most hit by synchr. radiation



Exchange counters:

LVeto 1- 5, 1- 7, 1-10  
 0- 5, 0- 7, 0-10,  
 1-4

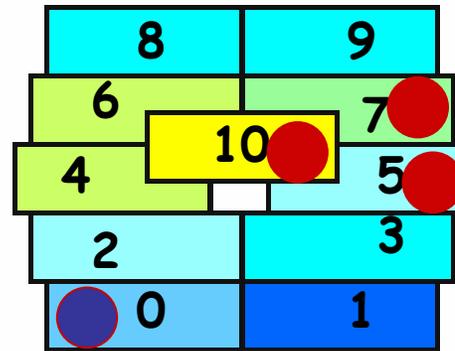
Exchanged PM: LVeto 0-0



LVeto 1



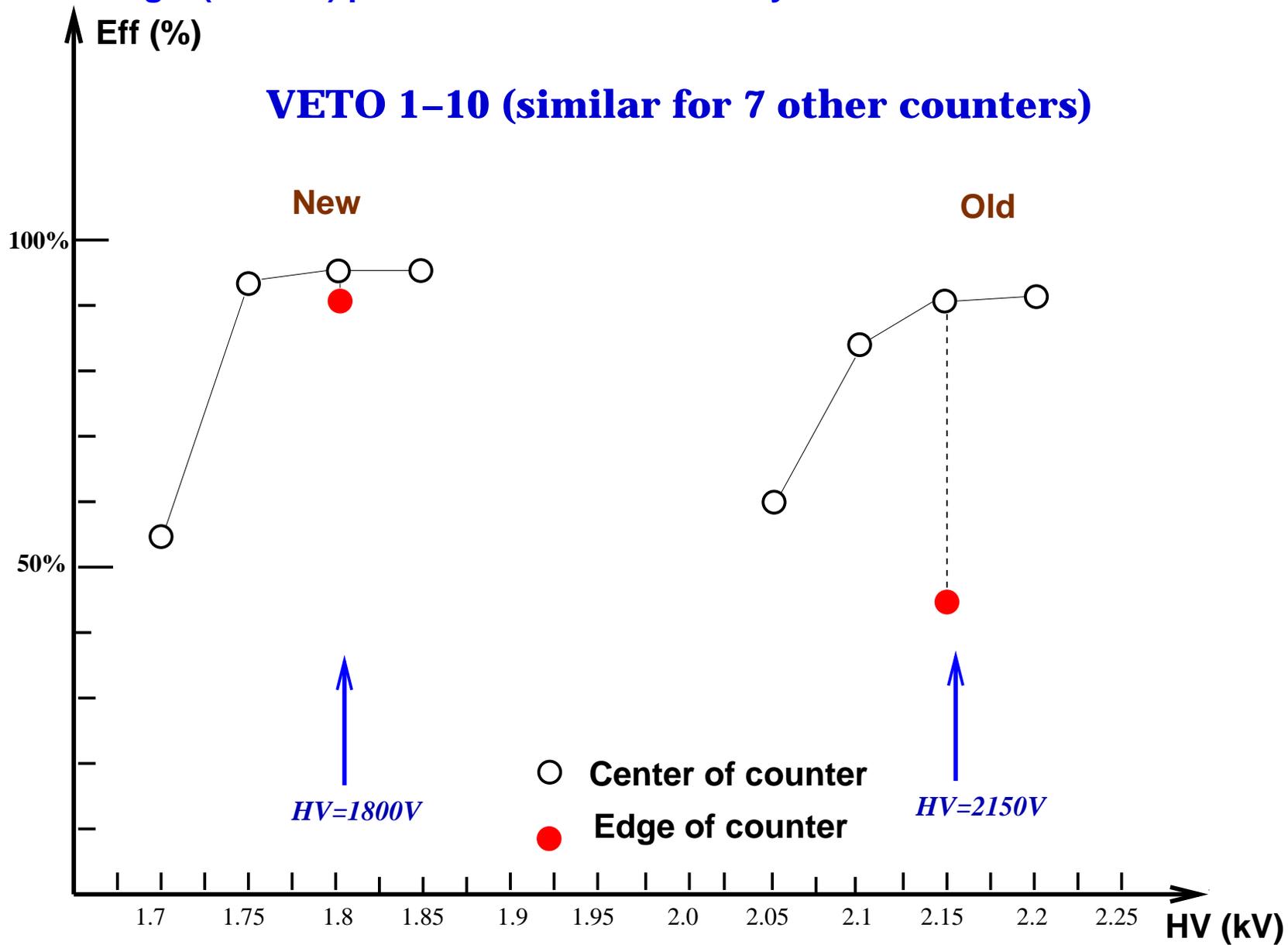
- - Replaced scintillator, PM
- - Replaced PM



LVeto 0

# Single (cosmic) particle detection efficiency vs HV for old and new counter

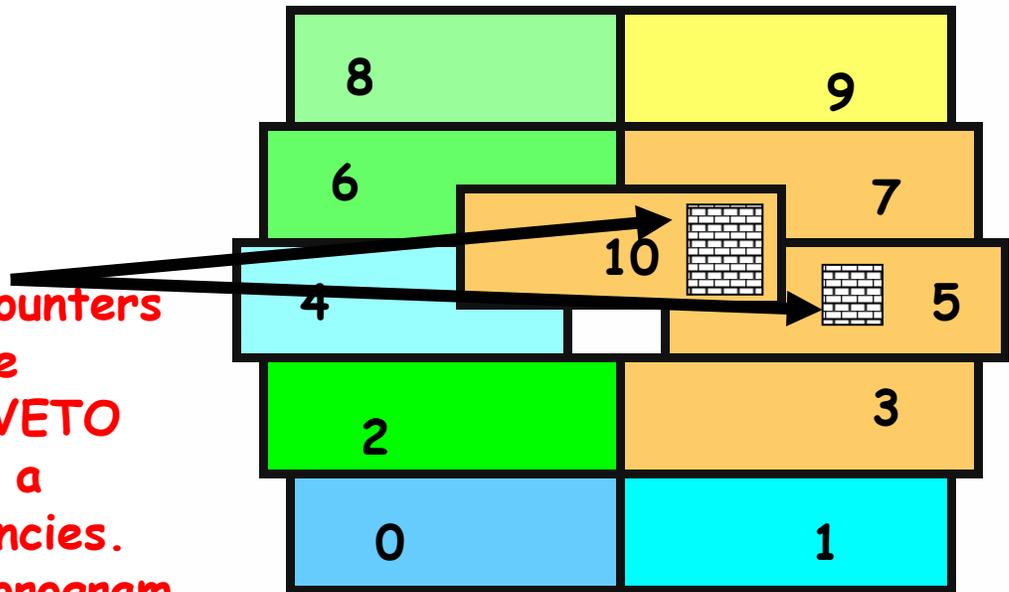
## VETO 1-10 (similar for 7 other counters)





A.Bunyatyan "ToF / VETO"

Two pairs of small scintillator counters are permanently installed to give coincidences with far edges of VETO scintillators 10,7 and 5 to have a regular control of their efficiencies. The rates added to monitoring program

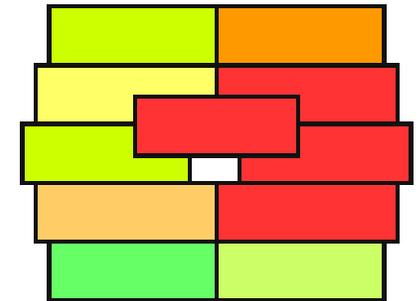


**Veto 1**

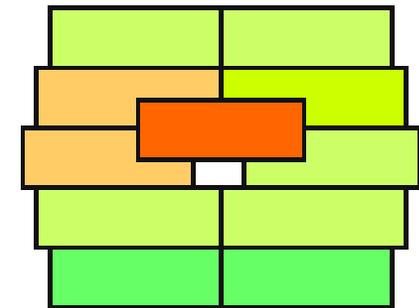
The latest runs show efficiencies of >90%

## Experience with the first luminosity runs:

- All VETO channels and trigger bits behave as expected
- In the first days we saw extremely high synchrotron radiation in VETO wall area. Significantly reduced by HERA tuning
- slow control alarms from VETO rate keep shift crew nervous
- can affect the PM efficiency
- the HV might need accurate tuning and compromise between efficiency and sensitivity
- as soon as we reach more or less stable running the veto off run is requested



LVeto 1



LVeto 0

“typical” picture  
of first lumi runs

## Other works on ToF/VETO

- All BTS counters and STOF have been dismantled, tested, evtl. repaired and installed back. Few signal and HV cables have been exchanged (e.g. BTS11 were completely destroyed by synchrotron radiation)
- The CFDiscriminators of VETO system have been tested and evtl. repaired (thanks to Armen Beglarian)
- Some readout modifications - TOF Mac is now getting status data (beam currents, run number, solenoid current, etc..) from new central trigger processor.  
Sending TOF histograms from Mac to the new DAQ has to be worked out (branch 11 will be switched off). Sending TOF data from new TDCs system to CDAQ is in progress
- FTI-2 signals are prolonged to the position of FTI-0 electronics for combining into the forward track trigger.

**VETO and TOF systems are ready for data taking**