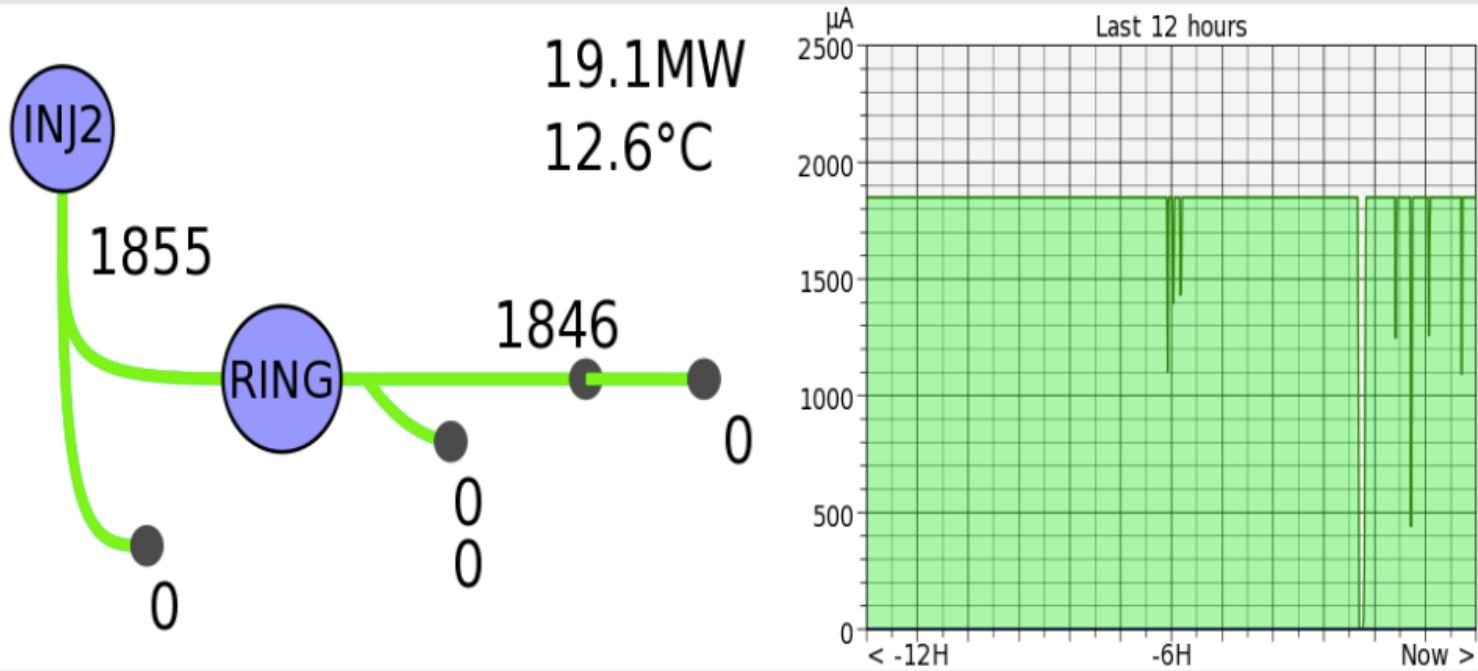




HIPA web page

High Intensity Proton Accel.

9.Oct 2019 11:40:47



```
INJ2 : Production
RING : Production
SINQ : idle

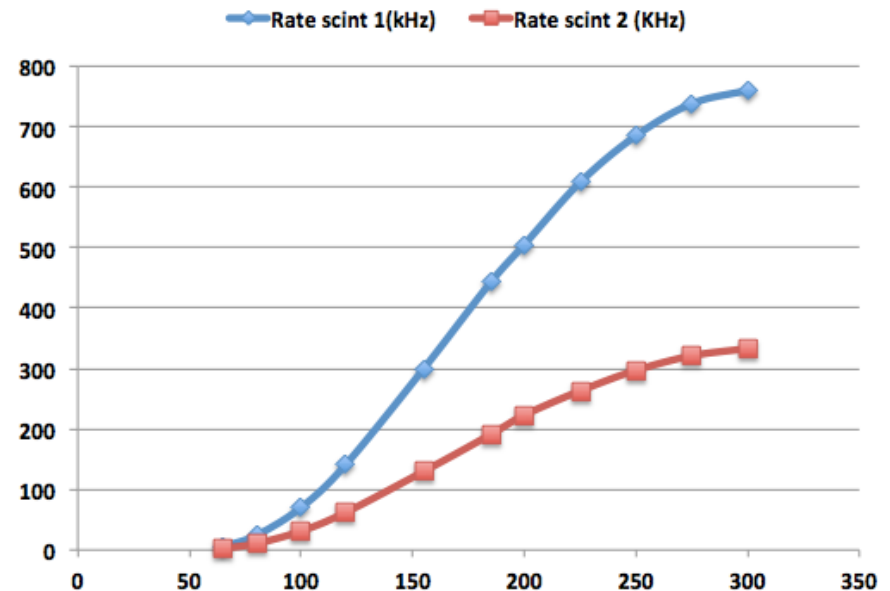
IP   : idle
UCN : idle
```

Slits

- A slit system (4 slits: L,R, T, B) allows to reduce the beam intensity
- We profited of the unstable and low intensity beam (105 μA fine scan; 1590 μA rough scan) during the MD on Wed. Oct. 2nd to calibrate the scintillator rate vs slit opening
- Distance between up- and down-stream scintillator ~ 490 mm



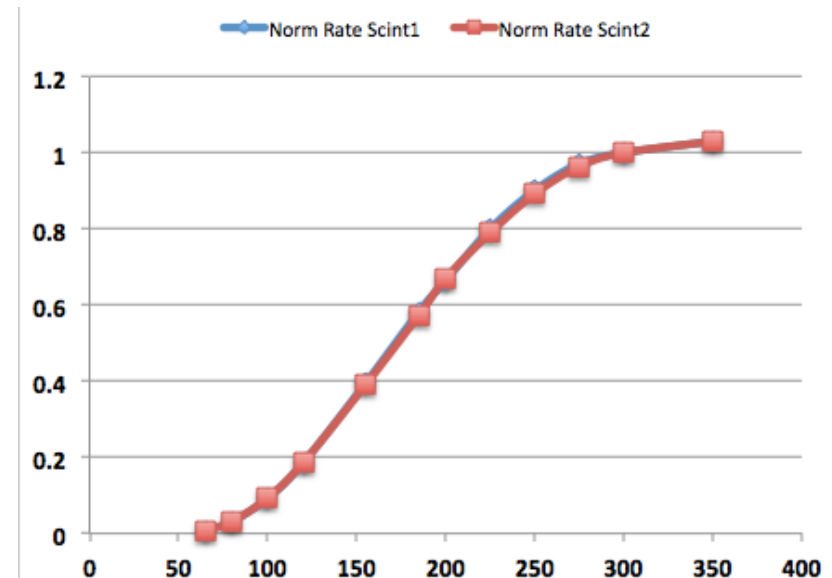
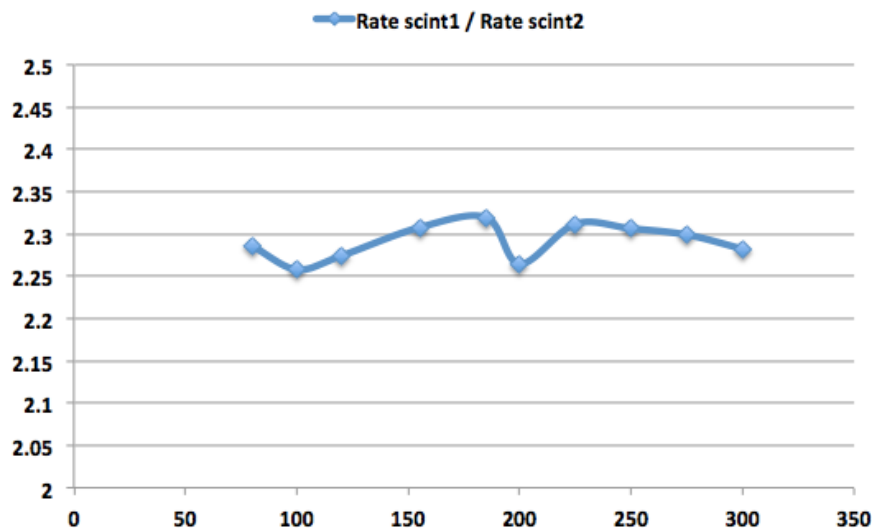
$I = 105 \mu\text{A}$



Slits

$$I = 105 \text{ uA}$$

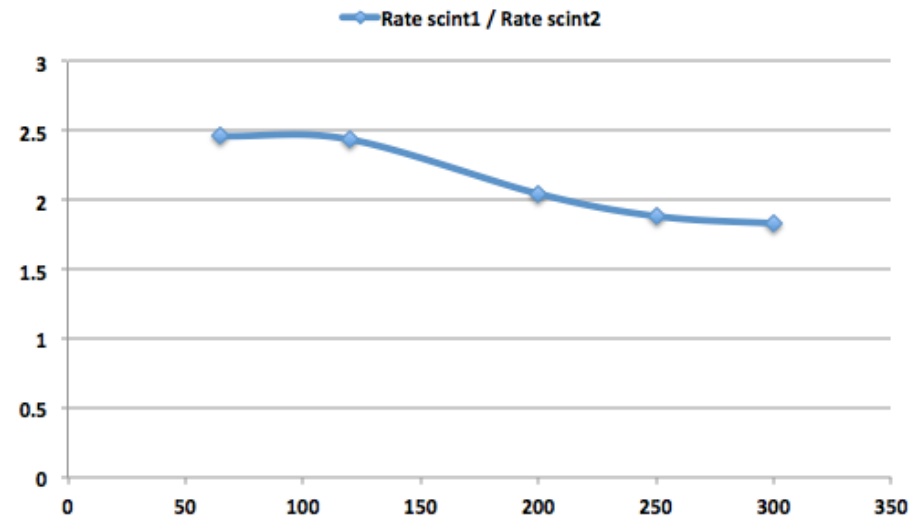
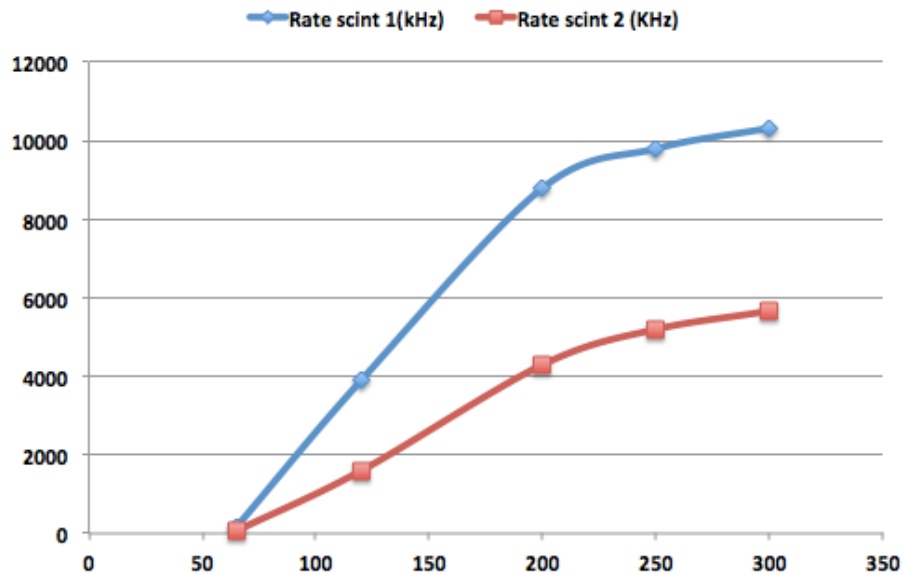
- Ratio between up and dwn scintillator \sim constant (max rate 7 kHz/cm² on up-stream scintillator) \rightarrow no saturation
- Scan was done up to 300 steps opening. No data available at 350 (used for most of the runs) with low intensity beam. GEMs measured \sim 3% higher current, consistent with the shape of the rate vs slit measured by us with the scintillators. At 400 steps aperture no current difference (wrt 350) was observed.



Slits

$$I = 1591 \text{ } \mu\text{A}$$

- Ratio between up and dwn scintillator \sim constant up to 40 kHz/cm² on scint1
- Ratio drop reduces when rate on scint2 >40 kHz/cm² \rightarrow consistent with a PMT rate limit of O(40 kHz/cm²)



Rate vs beam intensity

- We also profited of the unstable beam during the MD on Wed. Oct. 2nd to calibrate the scintillator rate vs beam intensity at slit aperture of 300
- Unfortunately no point in-between 157 and 1012 μA
- Distance between up- and down-stream scintillator ~ 490 mm
- Linear response up to 160 μA ($\rightarrow 14$ kHz/cm² on scint1; consistent with slit scan)
- Linear fit to the data points can be used to extrapolate the rate at higher intensity (with large error on the extrapolation over 1 order of magnitude in rate)

