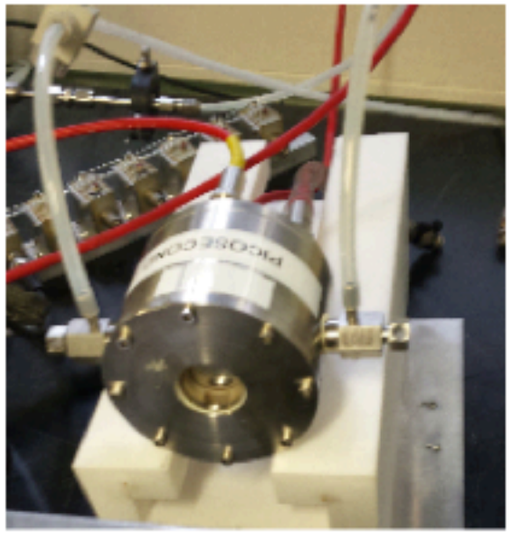
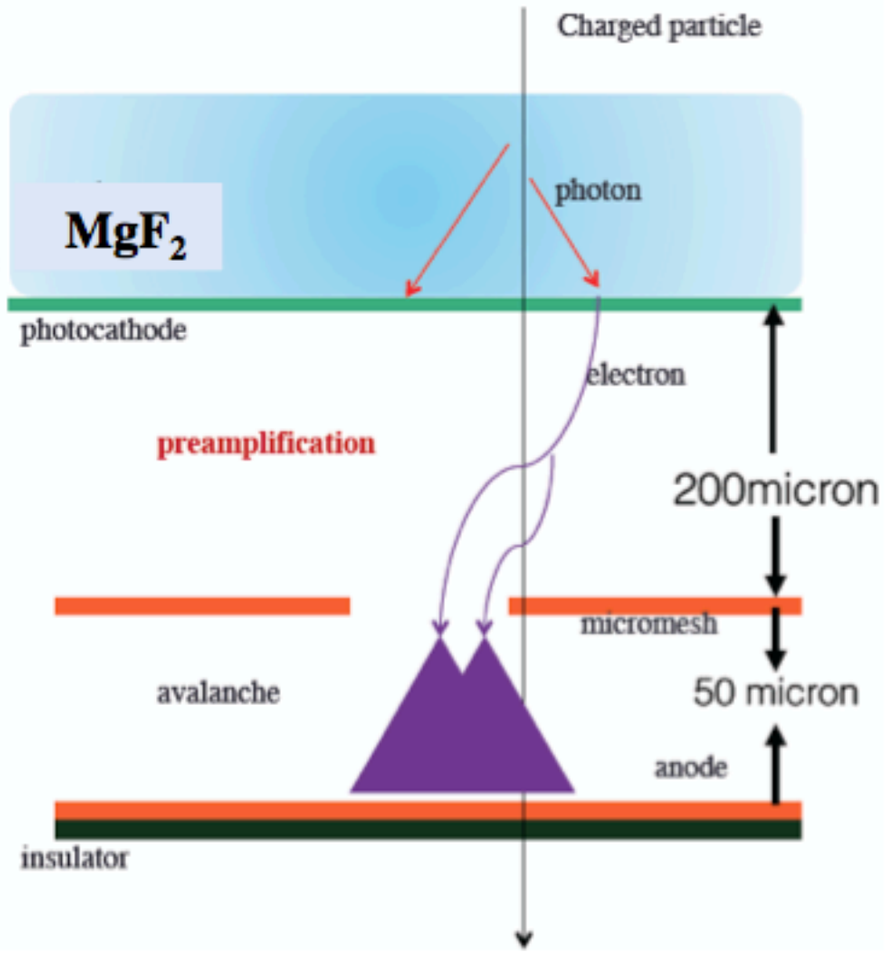
Timing with Micromegas

S. White, CERN/Princeton Univ., CERN talk June 2016 & RD 50/51 collaboration & Saclay lab

- Photocathode: metallic, CsI
- Gas: Ne-CF_4-C_2H_6 gas, or…
- Goal: N_{pe} ~80 pe/cm
- Goal: σ_{spread} ~200ps spread/pe
- Requires E > 10kV/cm !!
- Cividec amp 1-2 GHz BW
- SAMPIC waveform digitizer

Saclay detector:
(Y. Giomataris et al.)





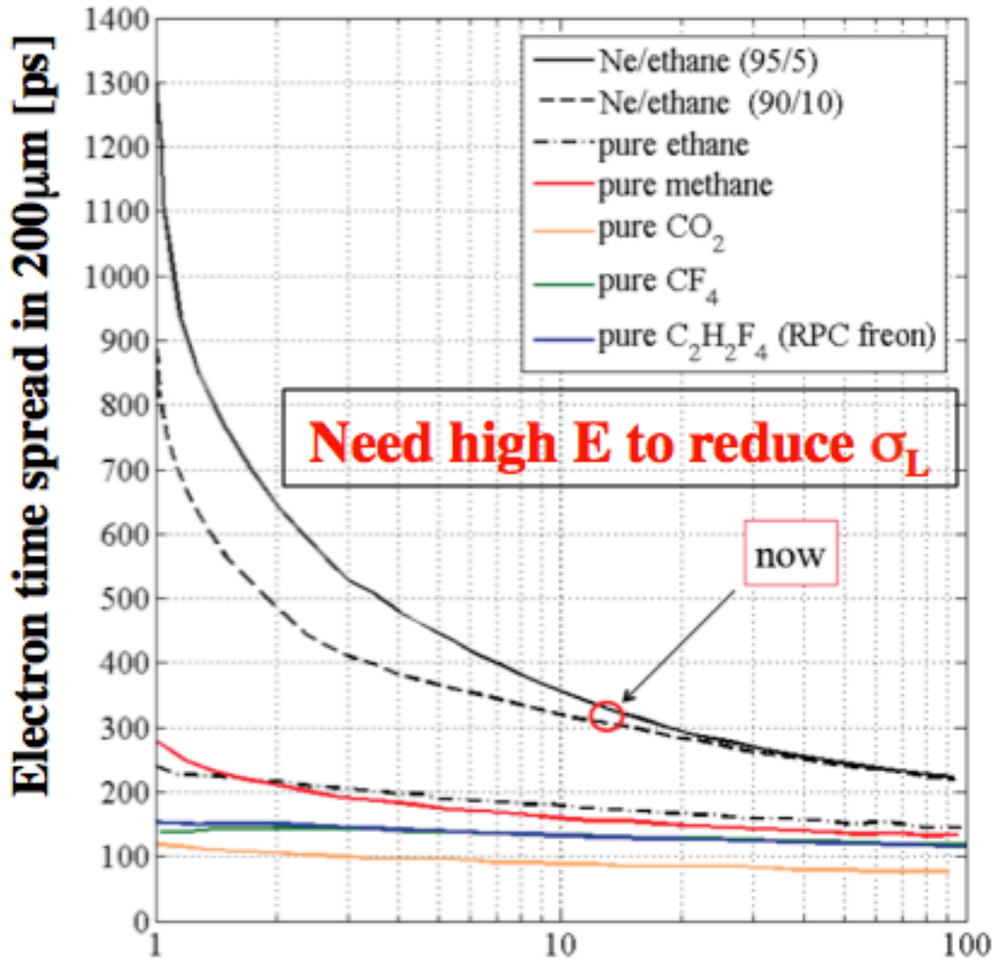
In principle one could reach:

$\sigma_t \sim \sigma_{spread} / \sqrt{N_{pe}} \sim 200/\sqrt{80} \sim 20$ ps

(In practice I doubt that it will be easy)

Very preliminary !!

Gas choice:



- **The gas choice is still being tuned.**
- **In principle the detector could reach 20-30ps resolution if N_{pe} ~80 and σ_{spread} ~200 ps, if electrons would arrive at the same time as a delta function (which they don't).**