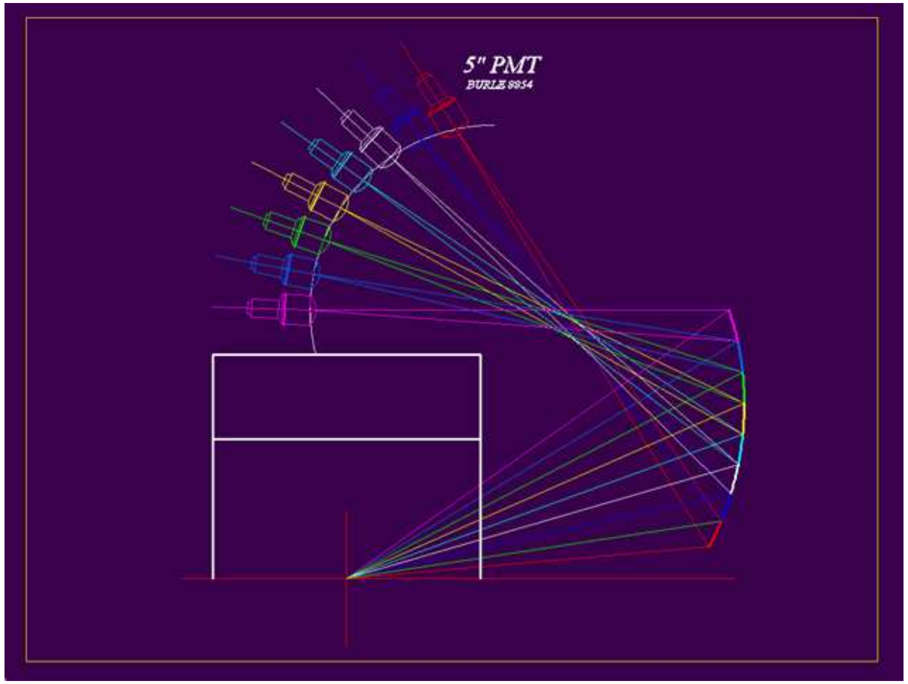
Gas choice: CO_2

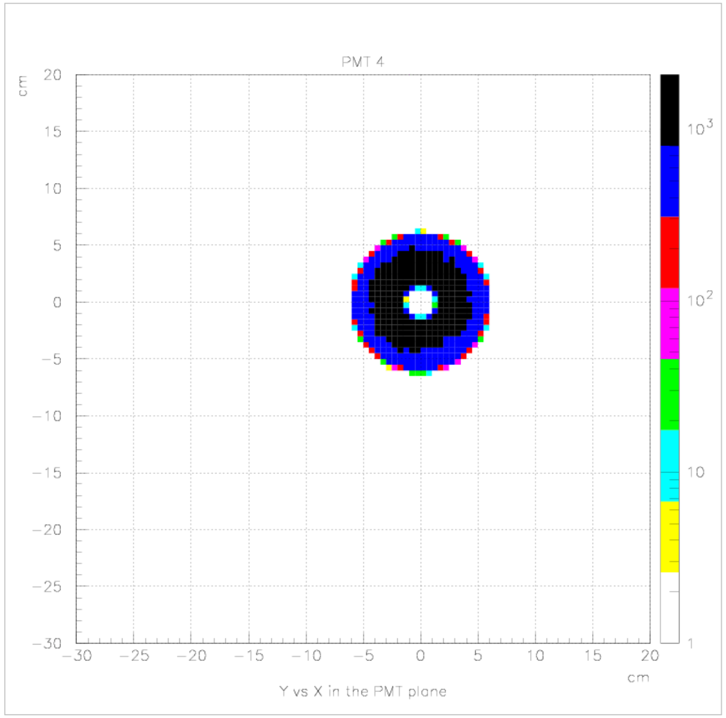
- Refraction index 1.00043
- Gamma threshold : 34, E pion = 4.7 GeV
- Good transparency at low wavelengths
- Neutral chemical properties

Design



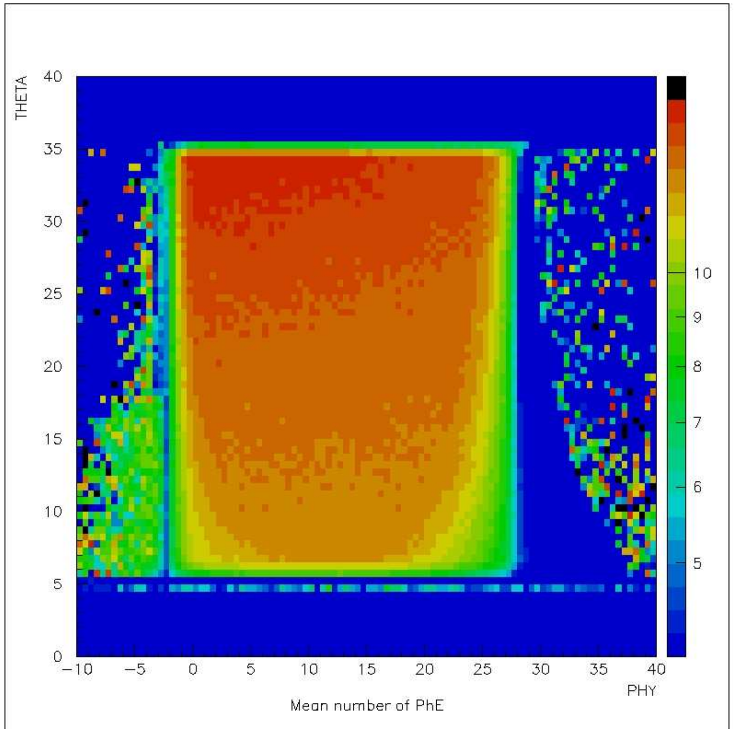
- Position just after the central detector and before DC region 1
- 8 mirrors per half sector
- PMTs in the solenoid shadow region

Point-like target



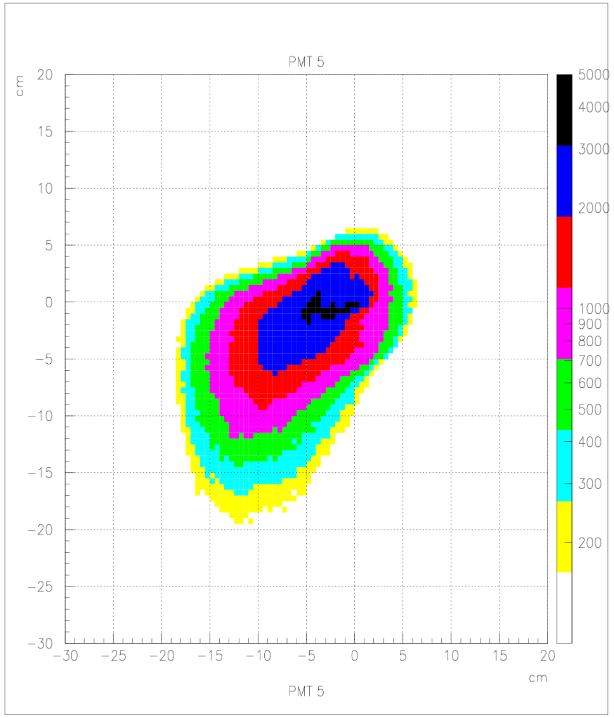
- Spot size ~ 10 cm
- Choice of PMT : 5”
- Spot position at the center of PMT

Number of photoelectrons estimate



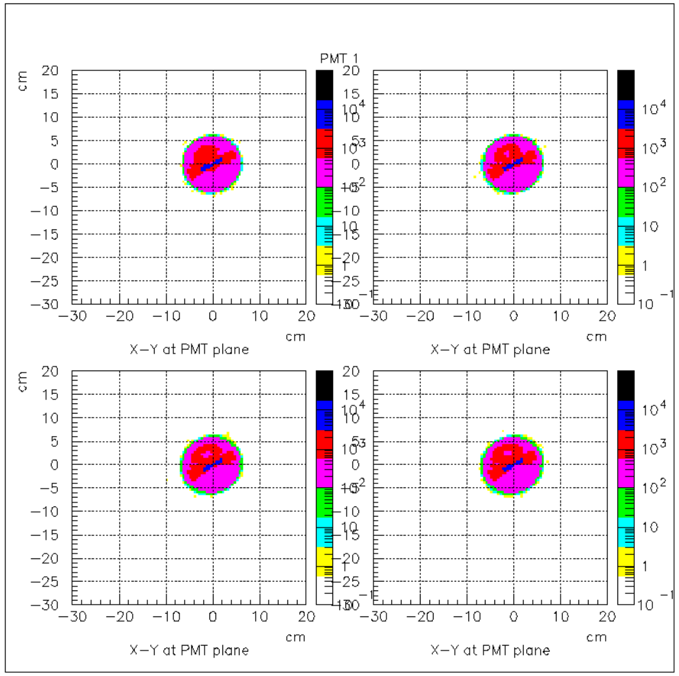
- PMT : XP4500, 5”, UV glass
- First estimate is promising: Nphe > 10
- Good acceptance on azimuthal angle
- Good efficiency from 5 to 35 degrees

Target size and position influence



- Target size on z suppose to be ~10cm
- Target position can be shifted backward
- Spot shift/size larger for largest polar angles
- WC 30 cm in diameter is enough

Solenoid field influence



- Magnetic field aberration is largest for small electron momentum
- 2.0 GeV simulations
- No large shift or size change

Background simulations

- Possible background from secondary electrons from the beam pipe shield
- Was done for old shielding, result in an acceptable background rate.
- Need to be repeated with thinner beam pipe shielding and IC near the beam.

What can we loose

- WC means an additional reflection. Factor 0.8 for Nphe or so.
- Magnetic field near the solenoid coils is not negligible, result in lower PMT quantum efficiency. The H value is not clear today.
- MC estimate for LTCC shows higher Nphe than seen by experiment by 1-2 phe

What can we gain

- UV glass to quarts window estimated gain ~30% (not confirm experimentally)
- We can move PMT away from the solenoid frame without loss of Nphe, and diminish the magnetic field influence