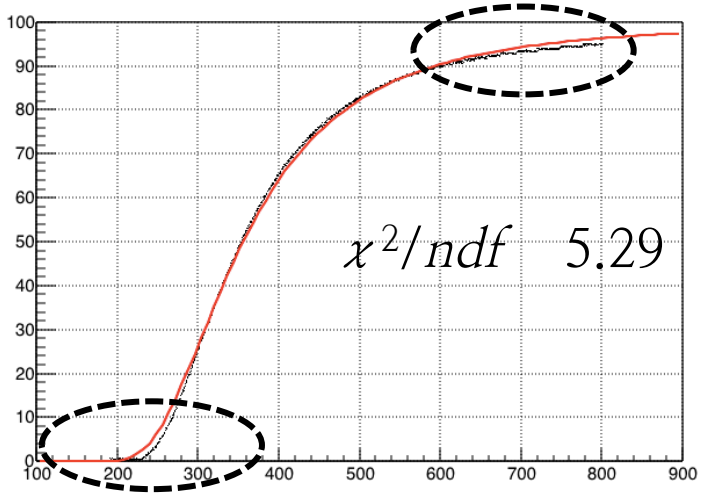
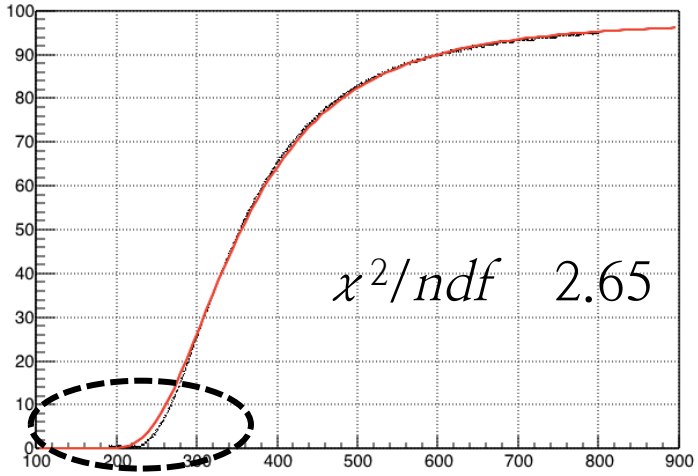
Refractive Index of Aerogel

Transmittance of *n*=1.04 Aerogels

Aerogel thickness in data sheet is 10 mm, so fitted with





$$T = 100e^{-10^{-7}([0]/\lambda^2+[1]/\lambda^4)}$$

After using additional variable to express thickness and changing absorption length term to coefficient

$$T = [0]e^{-[1]/\lambda^4}$$

fit function worked well??

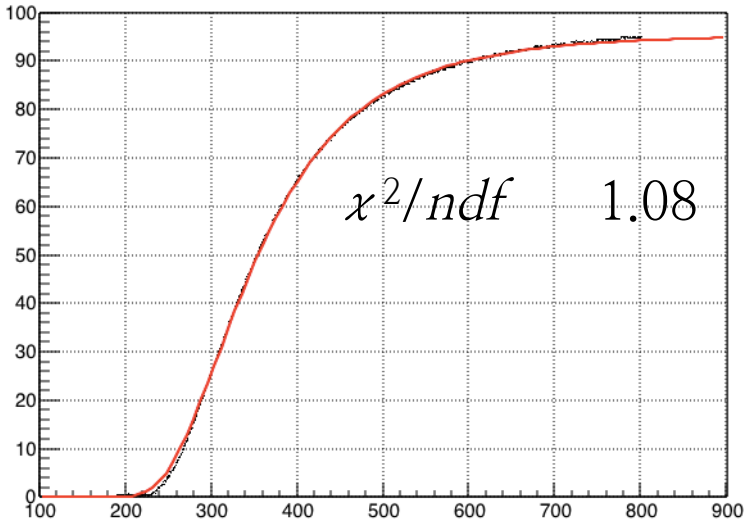
There should be thickness uncertainty.

This will be used for estimating the NPE of mini and mockup FAC.

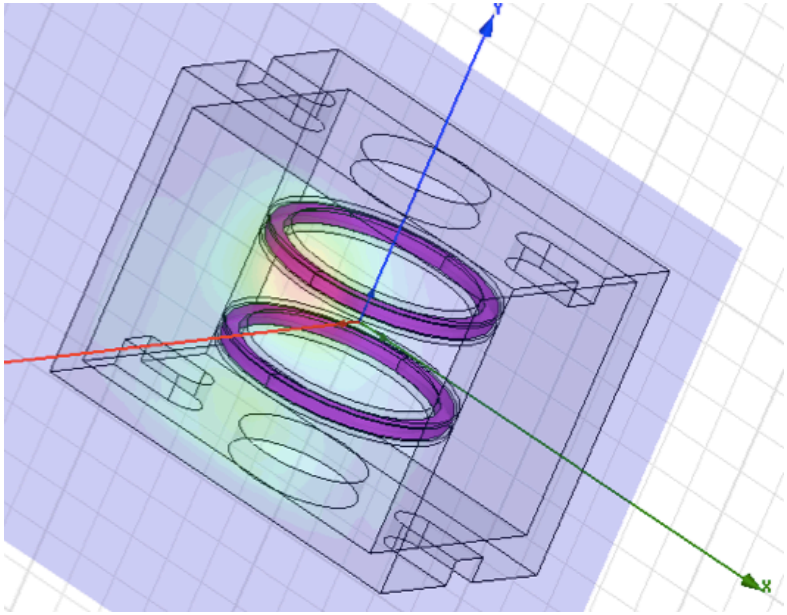
Transmittance of *n*=1.04 Aerogels

If use this fit function, fitting is very good but the estimated value [2] is below the zero. But this is not reasonable because absorption length is $\lambda^2/[2]$.

$$T = [0]e^{-[1]([2]/\lambda^2+[3]/\lambda^4)}$$

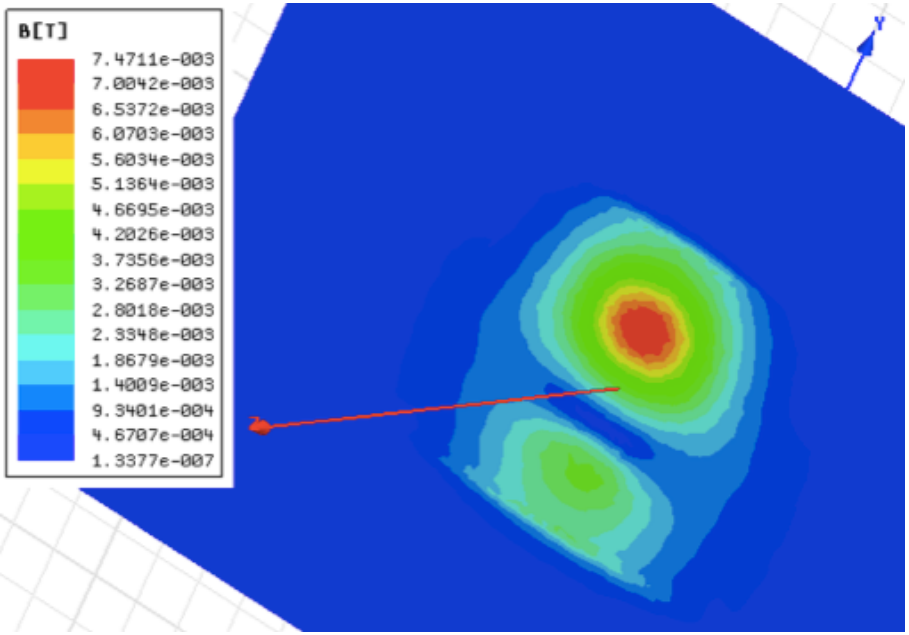


SC Magnet Fringing B-Field

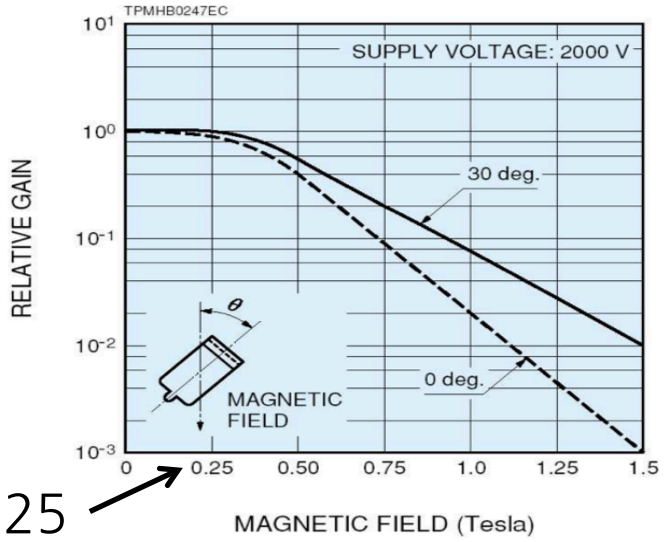


Current 70000 A.
Diameter 1100 mm.

Distance from coil center to FAC is about 625 mm.



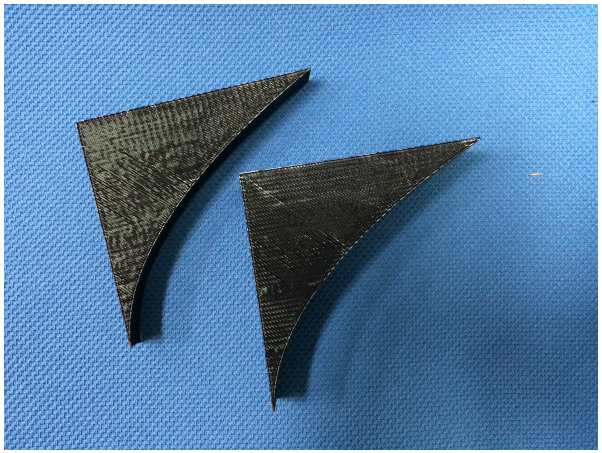
The maximum B-field is about 0.007 T. It is ok to FM PMT to measure the Cherenkov light!

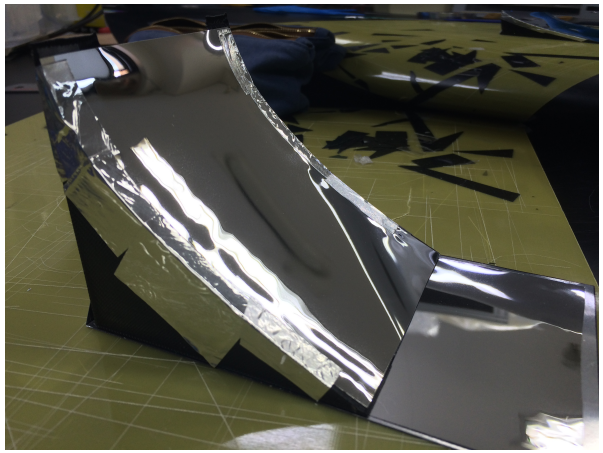


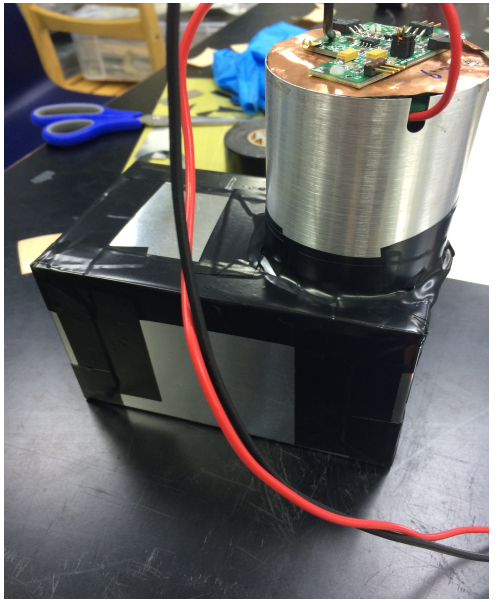
0.25

FAC Cosmic Test with Parabola Surface

At first, made test module with minimum geometry to study maximum NPE of FAC with parabola surface.





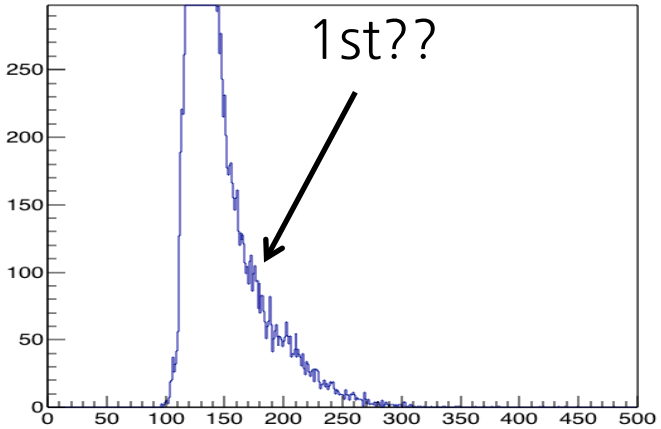


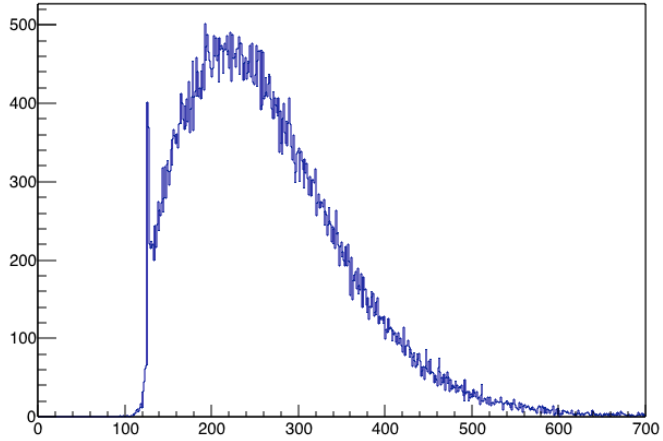
Goal is explaining and estimating NPE through lab test for performance of mockup FAC!

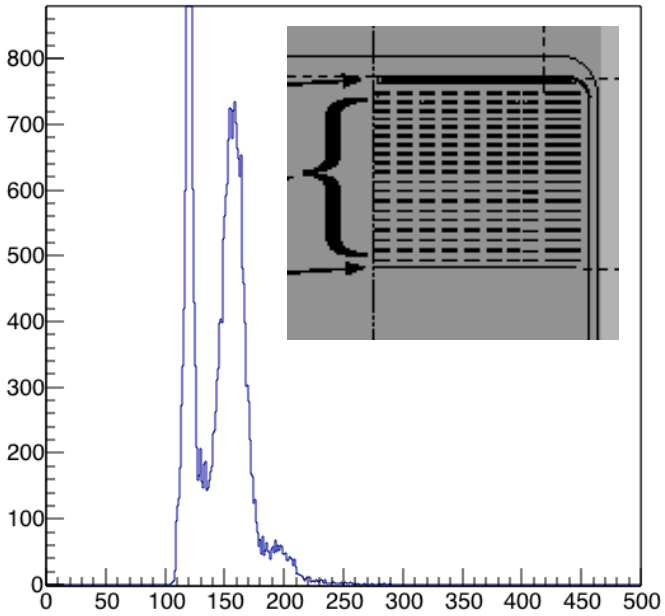
$$\mathrm{NPE} = \int_0^t dx \int_{\lambda_1}^{\lambda_2} d\lambda \frac{d^2N}{dxd\lambda} T(\lambda, x) Re(\lambda)$$

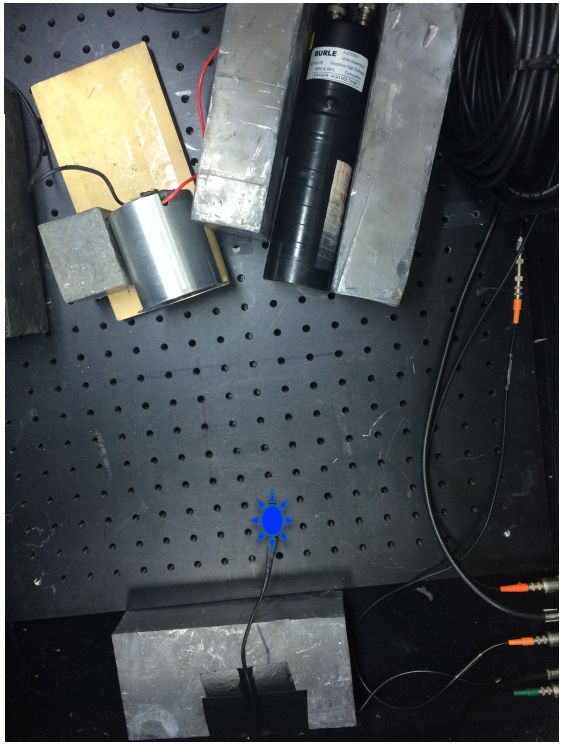
FAC Cosmic Test with Parabola Surface

Actually, this is not single photon spectrum.





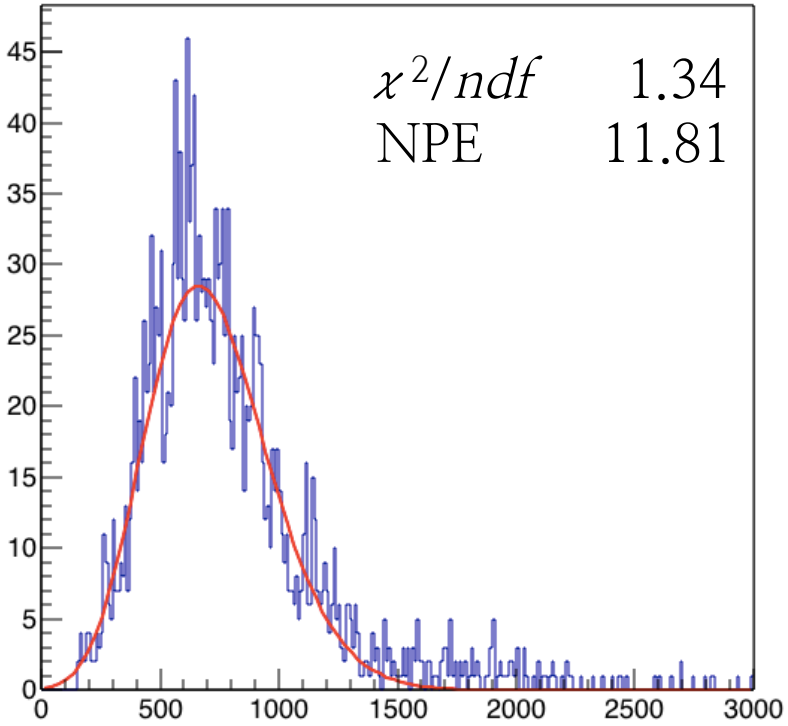




Though there is no clear structure for single photon with FM, it is expected the single photon channel is expected below 200.

FAC Cosmic Test with Parabola Surface

If we assume the single photon peak is around 180 ch, the NPE is about 12. But accurate single photon peak will be measured again for precise estimation.



After Dr. Lee come back with another FM PMT, will make test module with both sides PMT.

Going to make mockup size FAC as soon as possible.