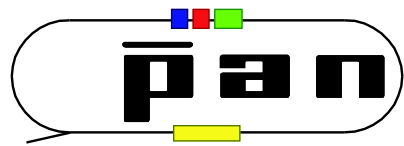


Current status of the DIRC activities in Giessen



Klaus Föhl
33rd Collaboration Meeting
Stockholm
20 April 2010

JUSTUS-LIEBIG-



UNIVERSITÄT
GIESSEN

persons and activities

- *boss:* Michael Düren
- *postdocs:* Avetik Hayrapetyan, Klaus Föhl
- *PhD:* Oliver Merle, Peter Koch, Benno Kröck
- *Diplom:* Marko Zühlisdorf, Michael Sporleder
- *Bachelor:* Nils Stöckmanns, Ann-Kathrin Rink
- *Master Project:* Stephanie Künze (this spring)

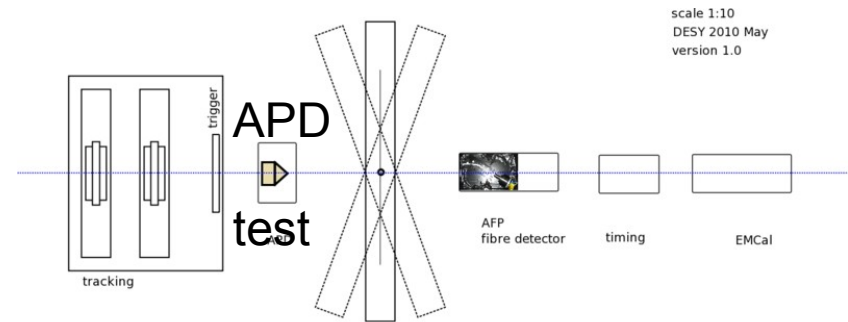
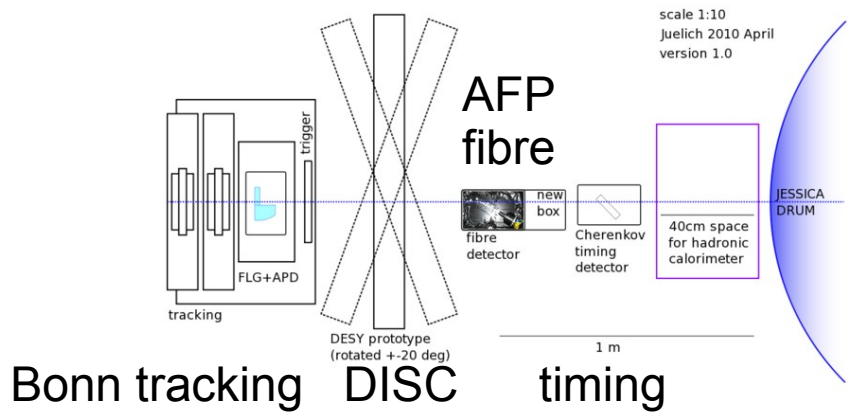
Activities

- test beam times
 - Darmstadt 2009-11 p 2 weeks 2-3h/day
 - Jülich 2010-02 p 1 week night shift
 - Jülich 2010-04 p 1 week night shift
 - DESY 2010-05 e 2 weeks most of the day
- WASA
 - (towards FLG prototype)
 - TOP simulations
- lab investigations
- PandaRoot (cooperation)

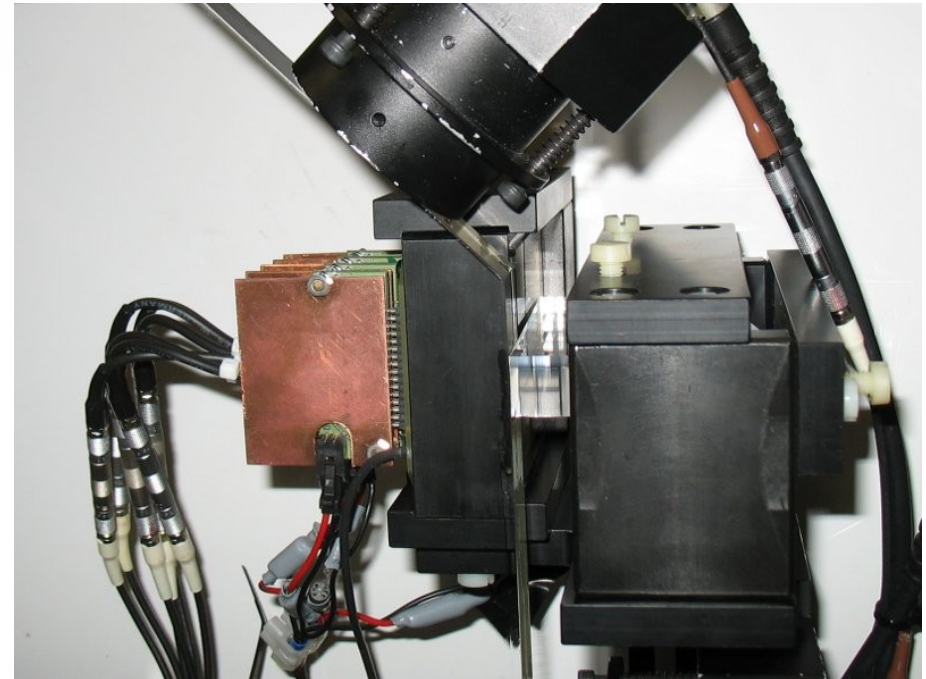
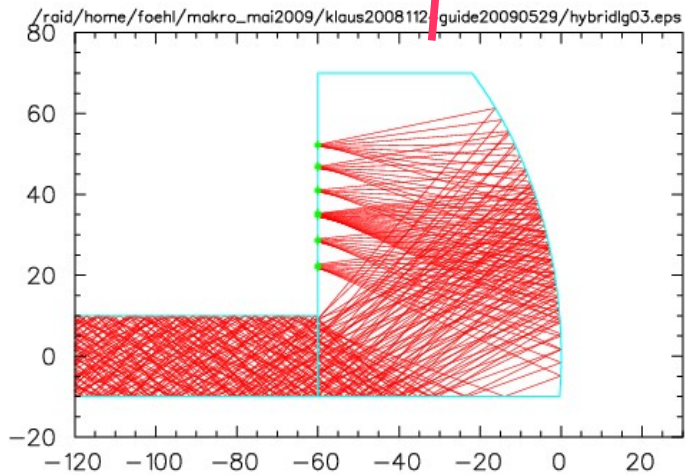
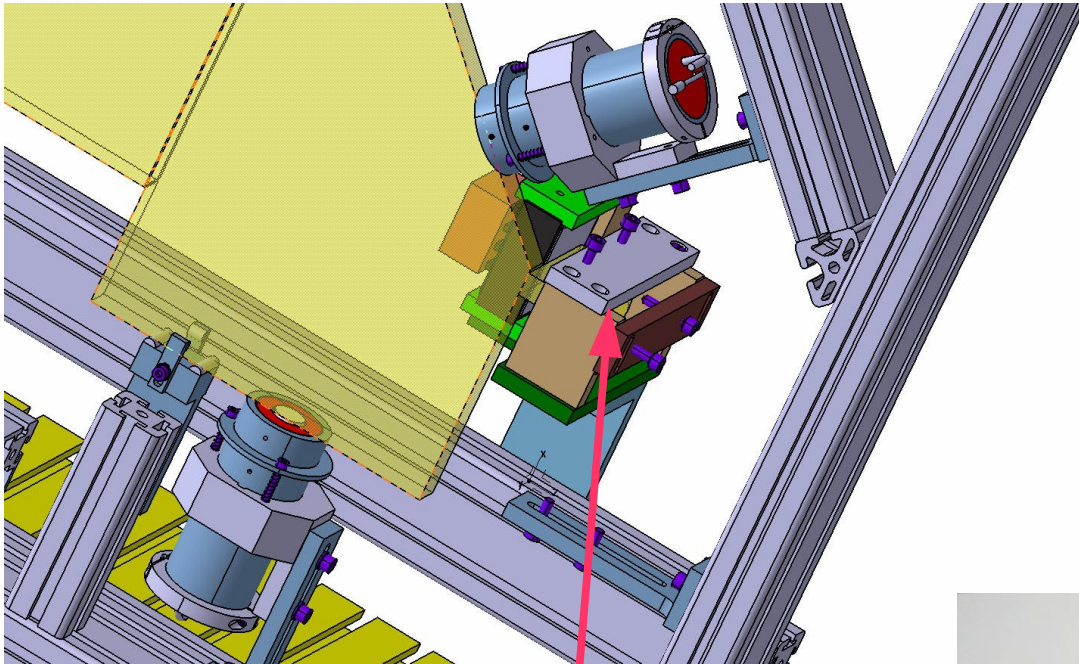
Test beam times

Jülich 2010-04

DESY 2010-05



Hybrid Design FLG on DESY disc

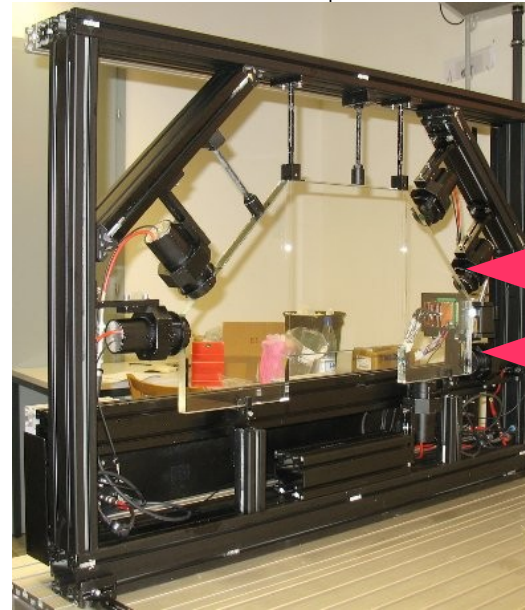
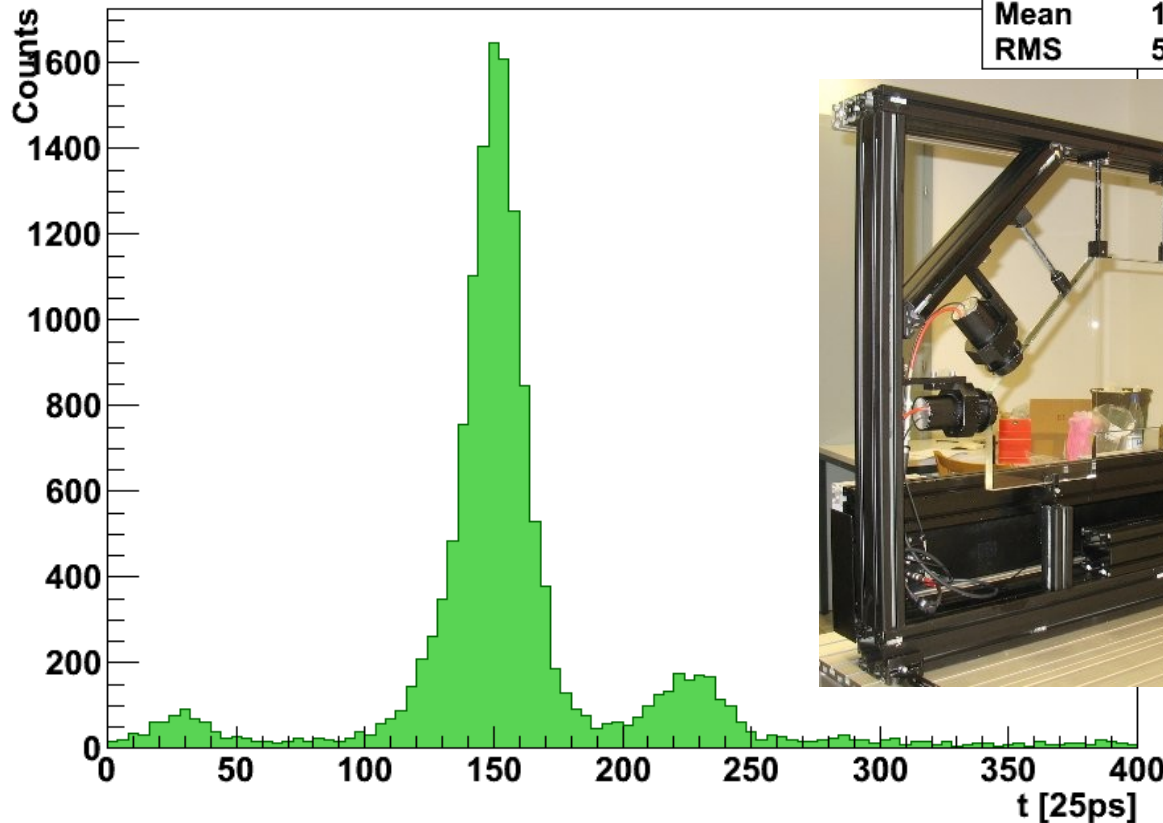


test beam analysis

Jülich 2010-04

TDC4-TDC2

Juelich 2	
Entries	34844
Mean	156.8
RMS	50.07

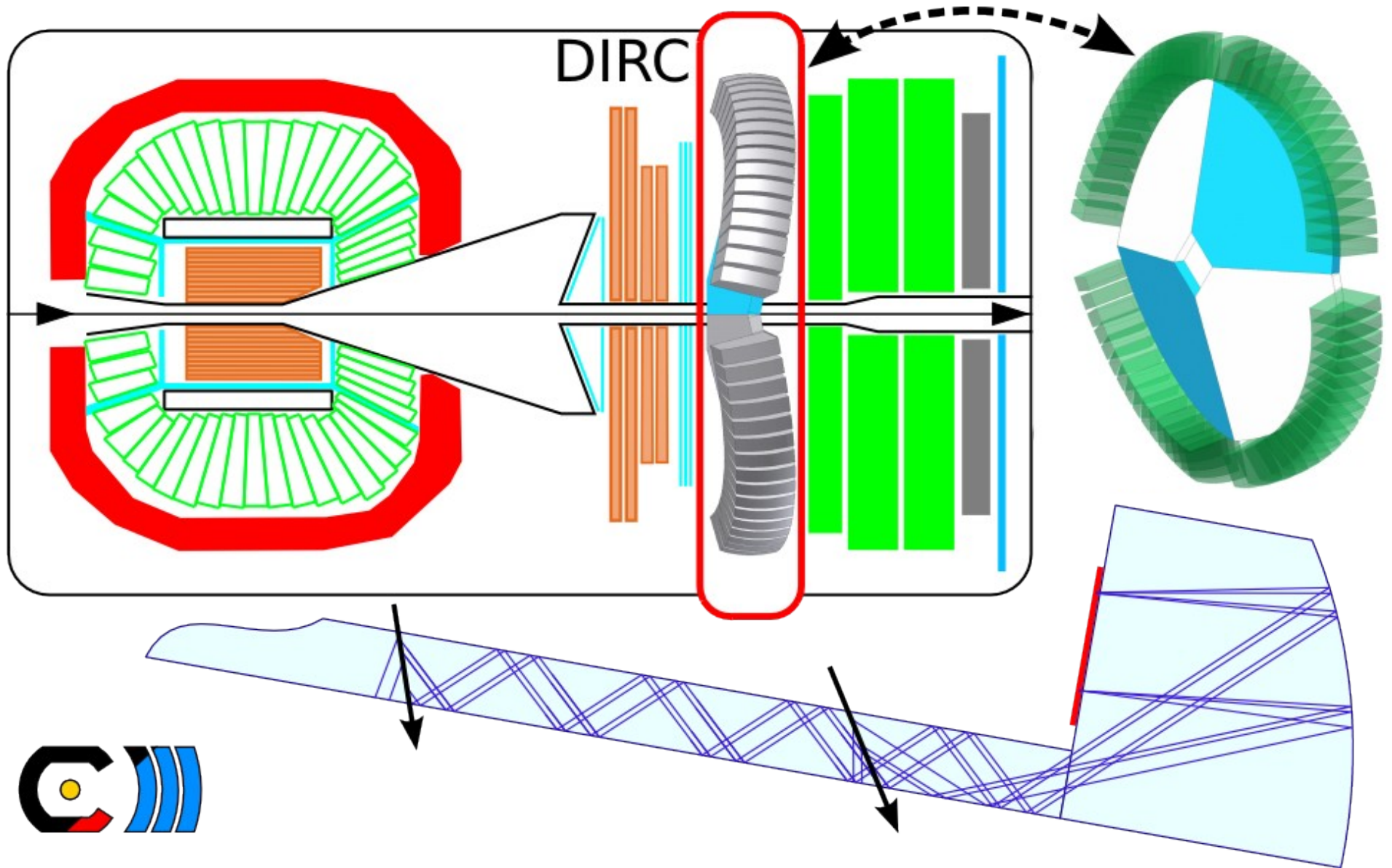


DESY 2010-05

DESY test beamtime just finished, people on the way back from Hamburg

Bachelor thesis: Ann-Kathrin Rink, Jülich 2010-04 analysis (with a wee help from Benno, Peter, Michael S., Avetik...)

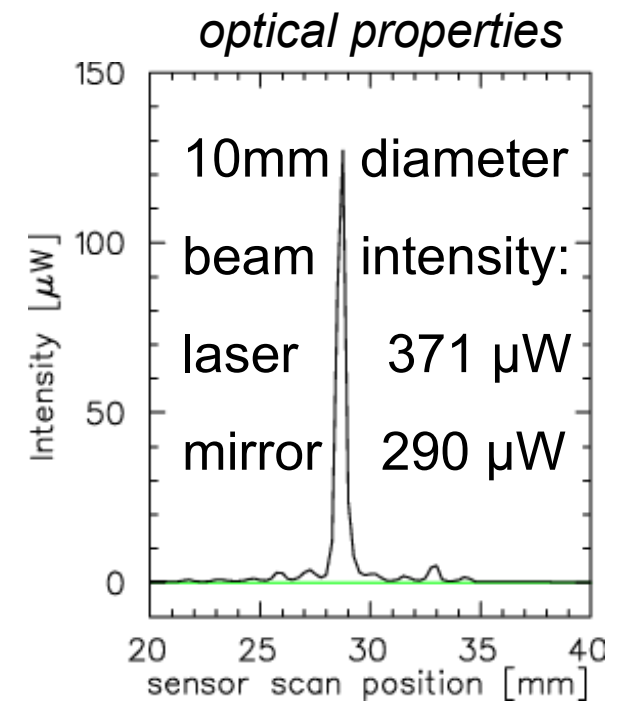
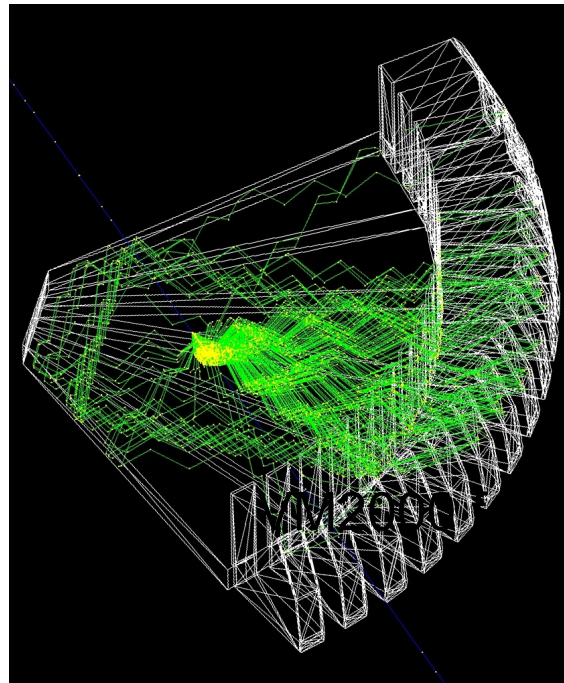
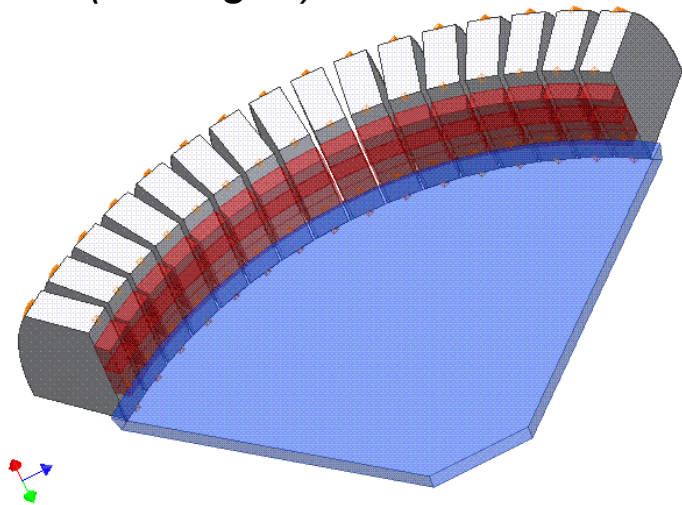
DIRC-at-WASA 1



DIRC-at-WASA 2

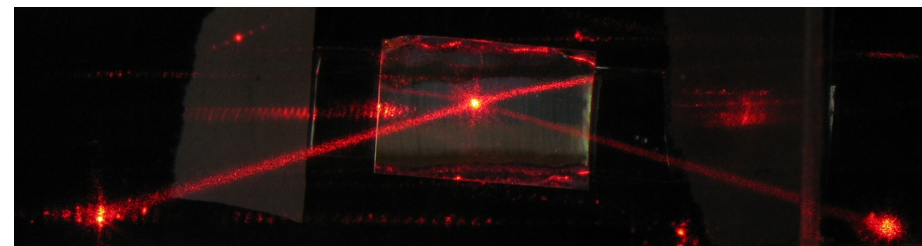
*Peter Vlasov (Bonn)
GEANT and physics sim*

*Eugene Dorochkevitch
CAD and mechanics
(Tübingen)*



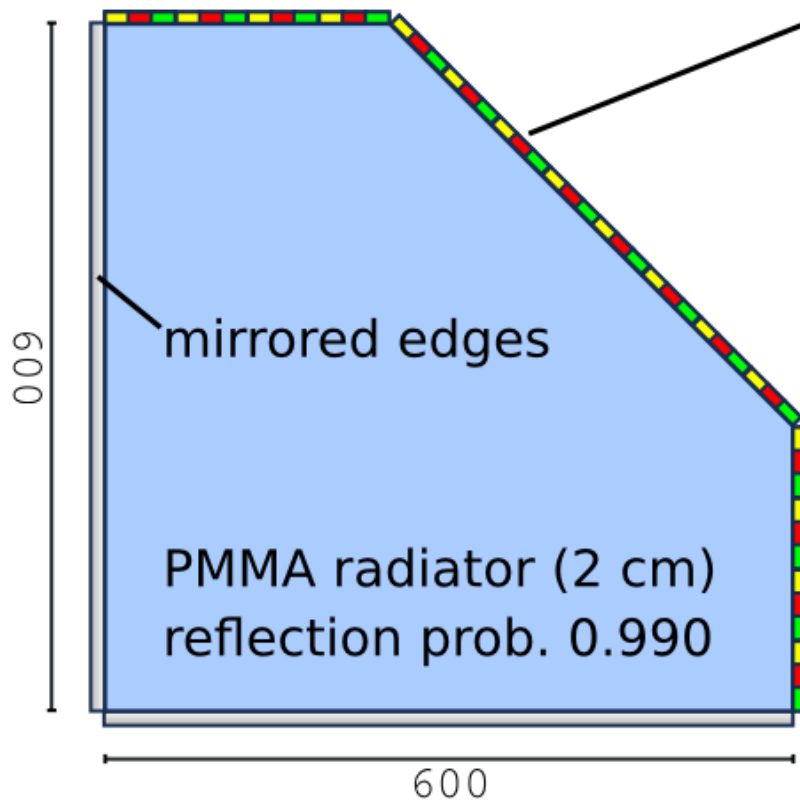
Marko Zühlsdorf, Peter Koch, KF

electronics, optics, photo sensors
(Erlangen crew)



TOP Simulations for WASA 1

A ToP option for WASA, quick simulation with real world parameters



48 logical channels in total:

on same substrate, CMOS technology

Philips SiPM with **internal TDC:**

**60 ps rms (single photon),
6 ps bin size**

3 dielectric bandpass filters
400 - 450 - 520 - 600 nm



(+) no external CFD/TDC/AMP needed,
SiPM provides internal digitization !

(-) custom electronics development for
chip readout may be necessary

TOP Simulations for WASA 2

Oliver Merle

A ToP option for WASA, quick simulation with real world parameters

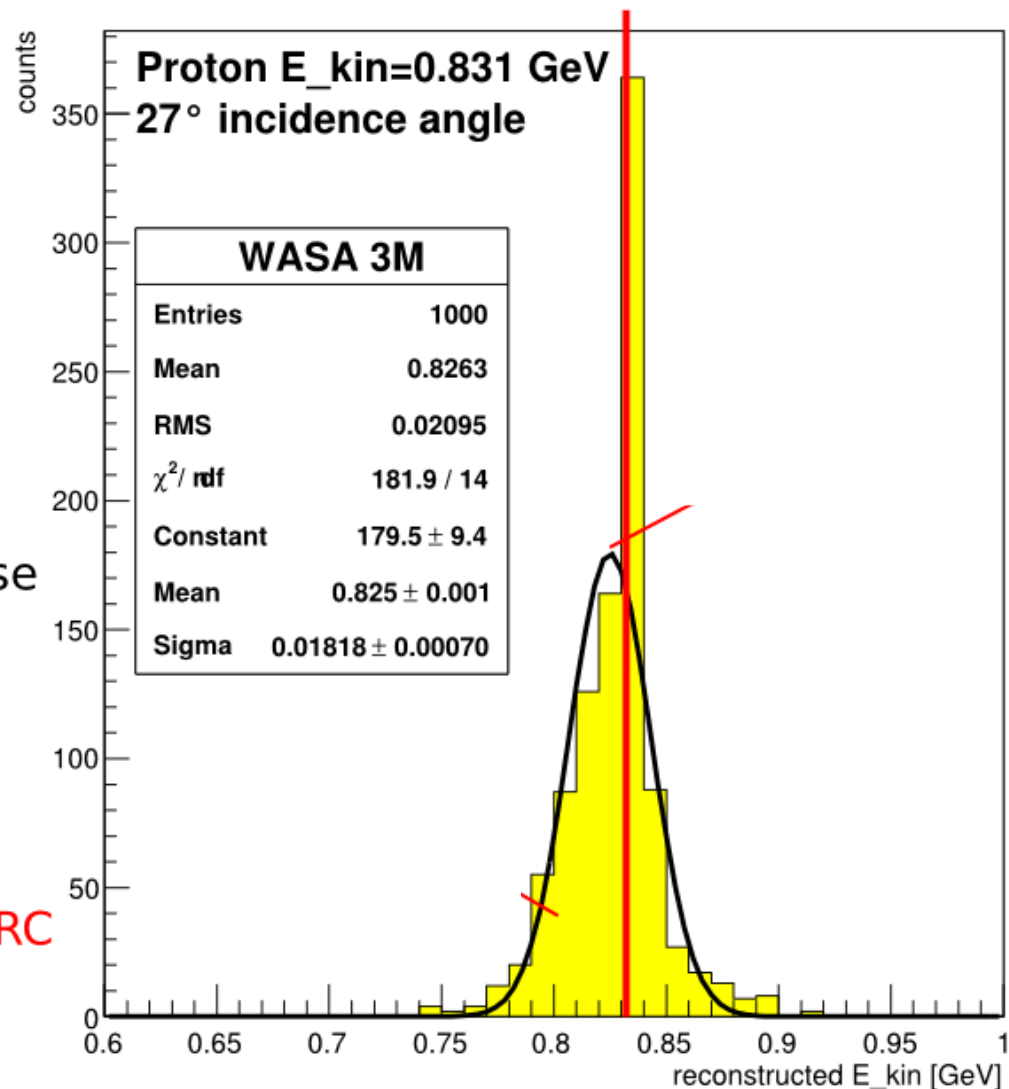
Reconstruction of 1000 proton tracks with $p=1.5$ GeV/c (831 MeV kinetic energy)

Mean: 825 MeV
Sigma: 18 MeV (2.16 %)

Analysis includes reflection losses and PMT spectral response but not (yet) bulk absorption.

Expect better Sigma if the tail can be removed.

Some likelihood parameters are still from PANDA ToP Disc DIRC reconstruction



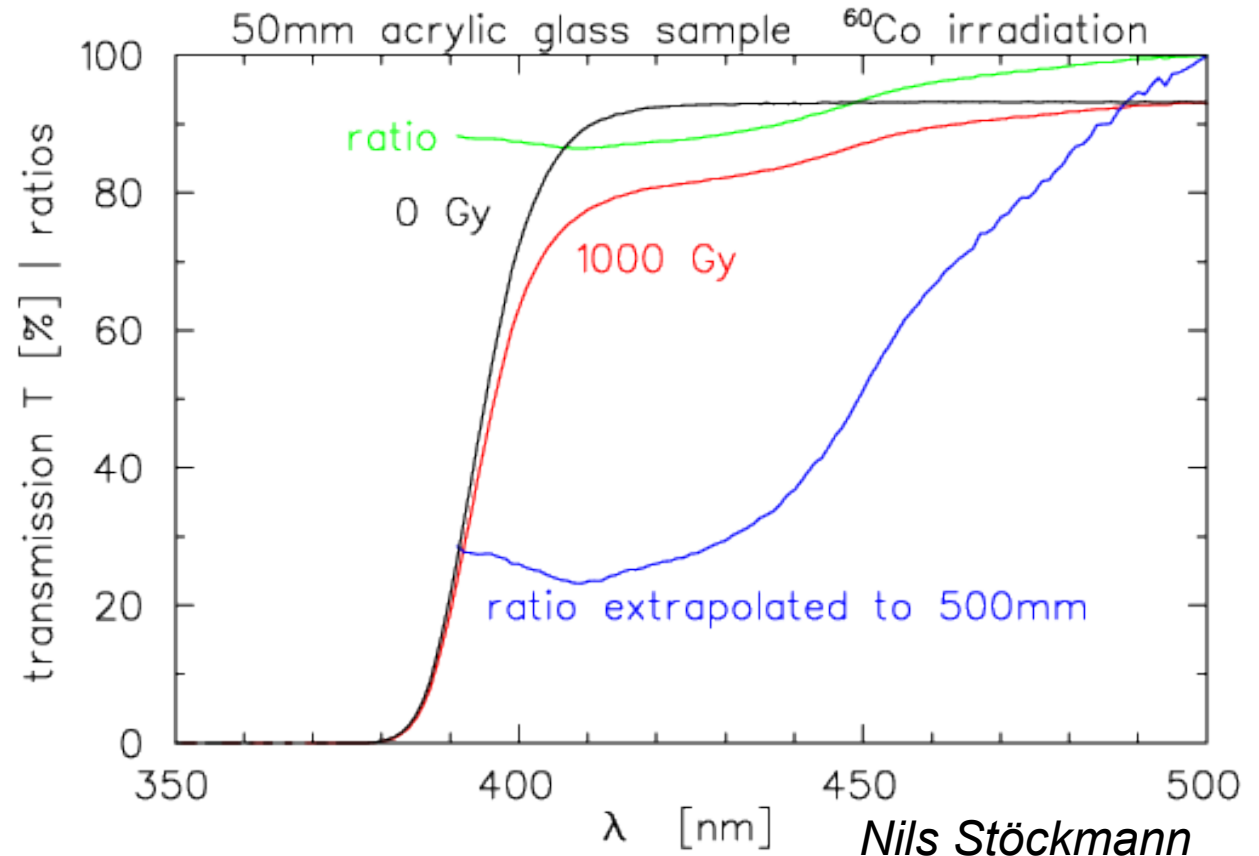
Spectrophotometer Studies

dichroic mirrors
transmission functions
at large AOI in medium

Stephanie Künze

radiation hardness
of dichroic mirrors

Nils Stöckmann



Faraday Effect

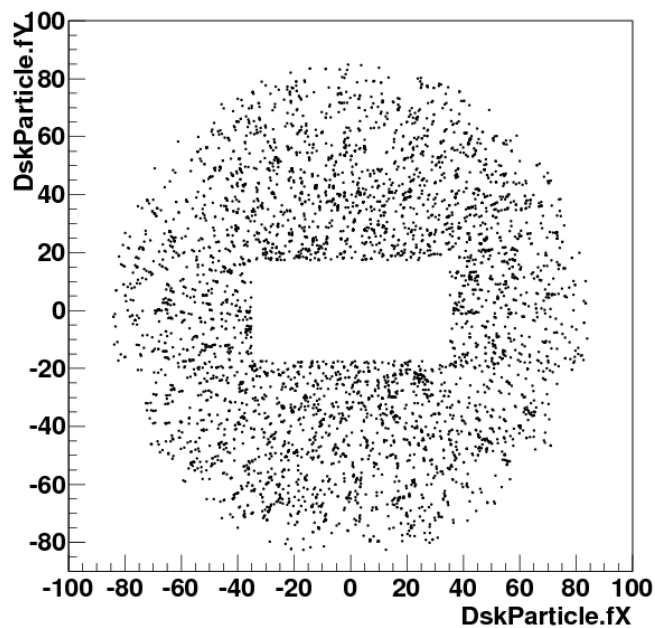
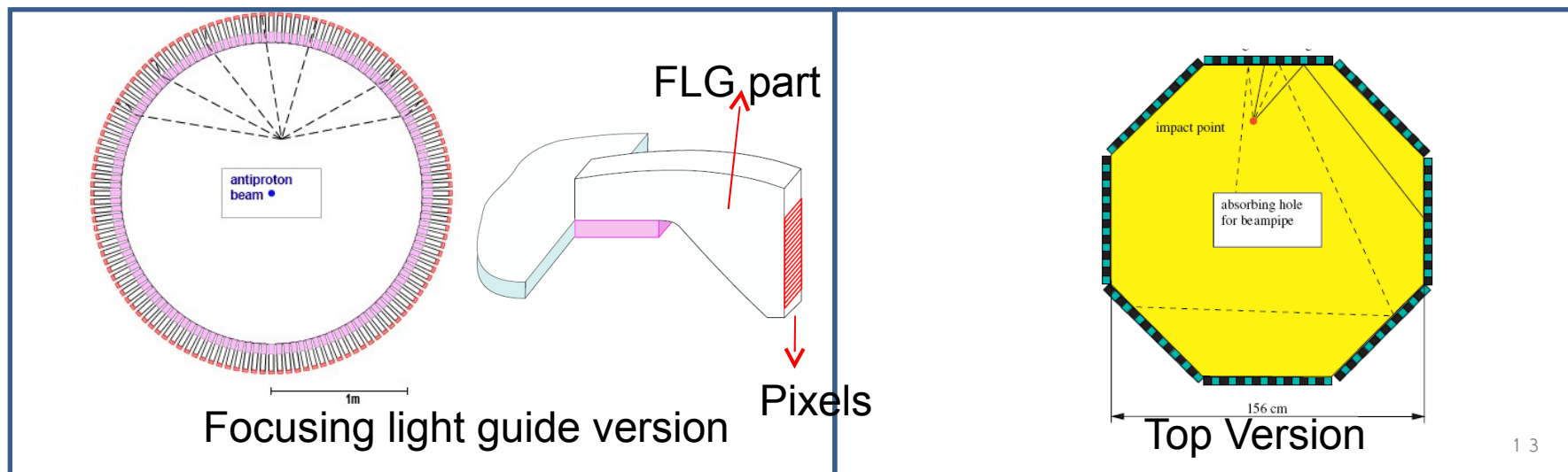
Large enough to cause 90 deg polarisation rotation in 25cm beam path

how to implement this in the optical part of the PANDA Cherenkov simulations?

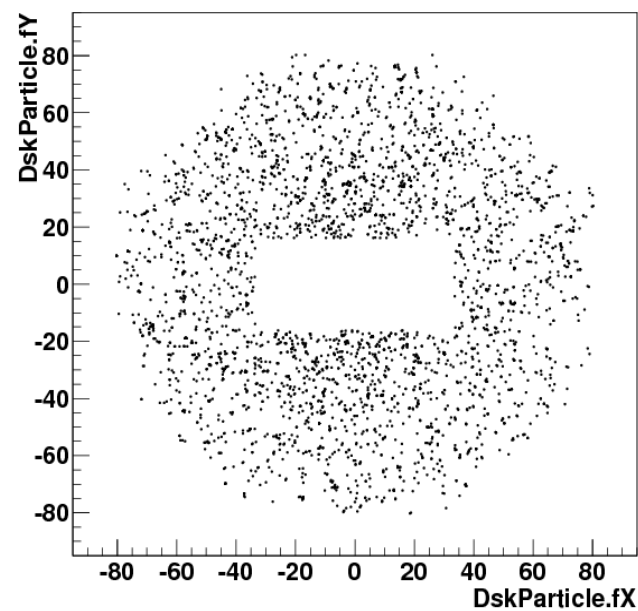
large effect at $B=1\text{T}$ thus polarisation averaged material properties should be ok

Software of disc DIRC in PandaRoot

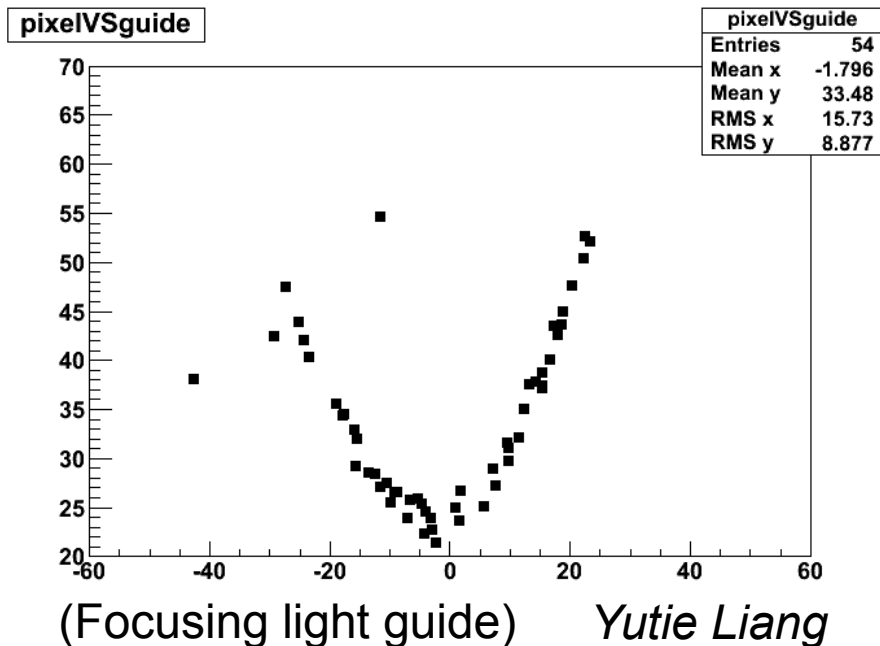
talk Yutie Liang , Monday 2010-06-14, Computing session



choice
of TOP
or FLG



Simulation of disc DIRCs



P.S. contributions visible in PandaRoot (svn as of 14/6/2010): *peterk*, *yutiel*

more work exists

– but not (submitted/visible) in svn - :
Roland Schmidt, Oliver Merle,
Peter Koch, Klaus Föhl, Derek Glazier,
Gordon Hill, Tibor Keri

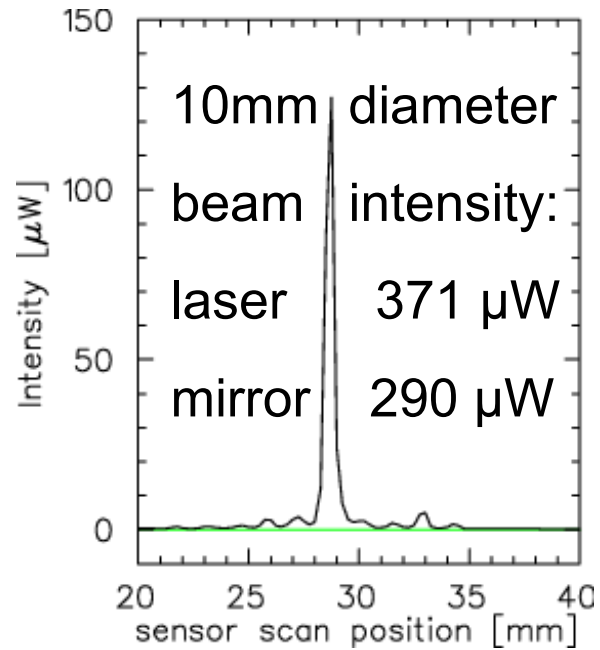
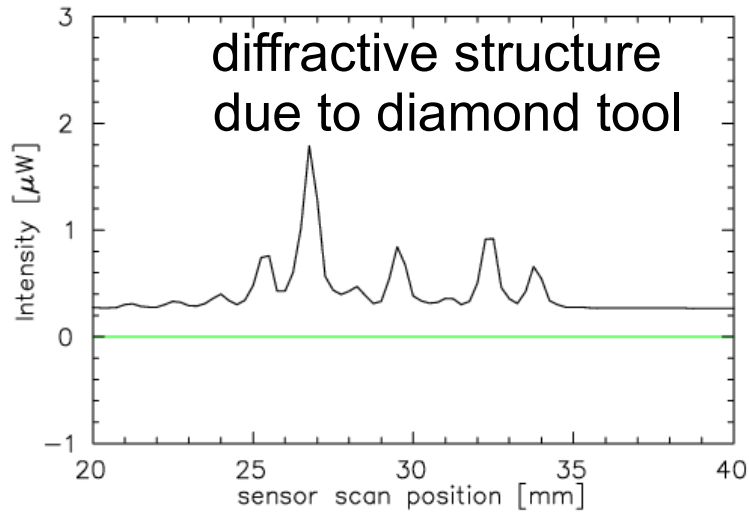
- done
 - hit patterns in PandaRoot
 - (PID from fast simulation)
 - tracking-disc correlation
 - particle type probabilities
- envisaged work package
 - beta value from hit pattern analysis in PandaRoot (plan for red thread only – implement basic analysis)

Conclusions

- DIRC activities ongoing
- Test beam times just finished – to be analysed
- design studies (TOP, hybrid) & simulations

backup

Light Guides and VM2000 foil



- VM2000 foil

Marko Zühlendorf, KF

