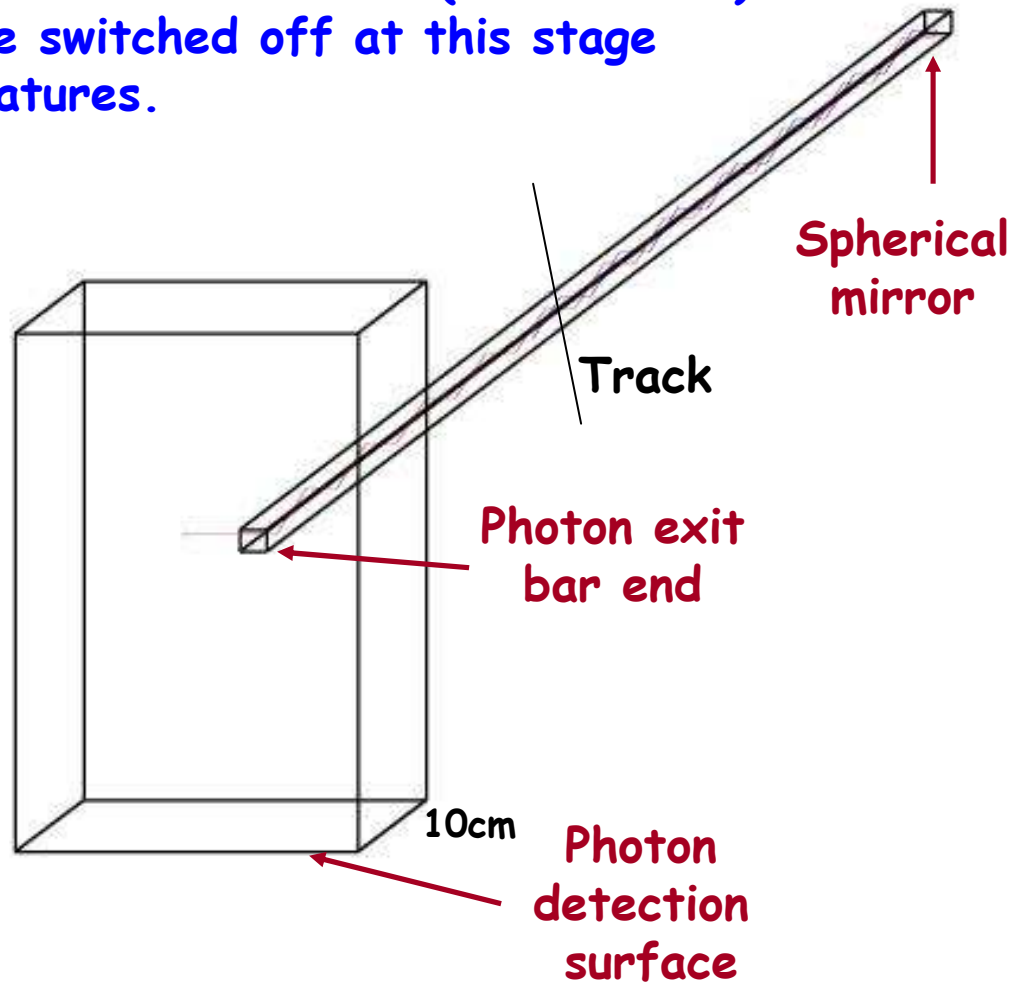


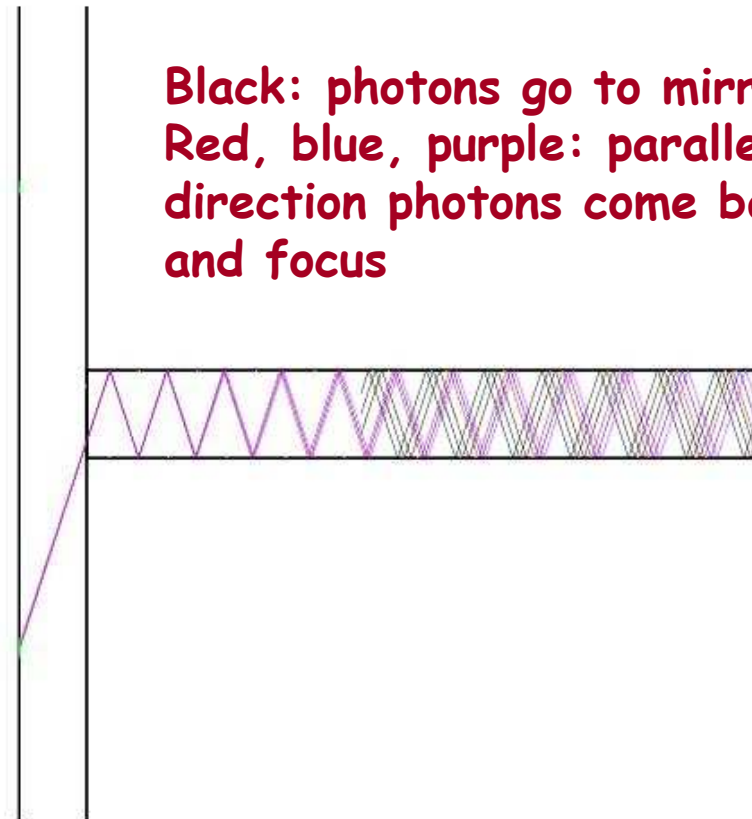
I have started studying of new configuration of DIRC (tof ?)
It is now in stage of "spherical horse in vacuum".
I described volumes and tuned fDIRC code (visualization).
All smearing effects were switched off at this stage
to understand general features.



It seems that focussing works well.

General features:

1. All parallel direction photons come in the same point in bar exit end (photon emission position uncertainty on track is removed)
2. Good focussing (large mirror radius).
3. Two images (top and bottom).



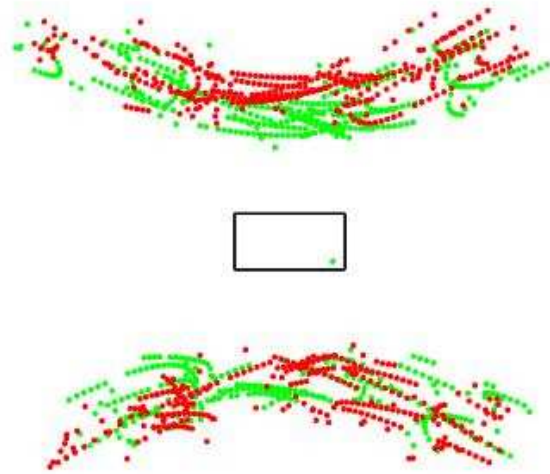
Black: photons go to mirror.
Red, blue, purple: parallel
direction photons come back
and focus

Timing is only way to separate pion and kaon.

We get scratches in x - y - t 3-dimensional space; each scratch is fixed by number of bar wall bounces.

Next steps:

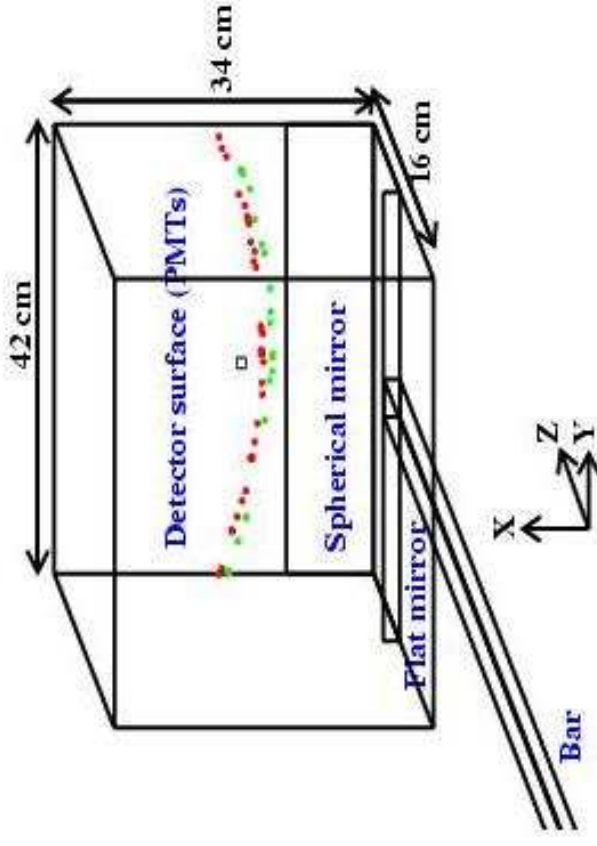
1. To switch on smearing effects one by one (bar imperfection, wavelength, fluctuations).
2. Try to build likelihood.



END

Focussing DIRC design simulation.

K/ π separation at P=2.0 GeV/c



Requirements:

1. High efficiency in whole charged track momentum and angular intervals.
2. Compact size (to fit in upgraded Belle detector).
3. Modest cost.

1. Synthetic Fused Silica Bars 17.2 x 35.0 mm (for simplicity 12 BaBar like bars).
2. Spherical mirror 100 x 420 mm (one per box).
3. Flat mirror (used to decrease size of box by factor of two).
4. Box 160 x 340 x 420 mm filled with purified water (12 boxes x 12 bars).
5. Wall of PhotoMultipliers with pixel size 60 x 60 mm (\sim 3000 channels/box).

DIRC uncertainties

Uncorrelated	DIRC BaBar	Focussing DIRC (L=340mm)
Size of PMT	0.4 × 28 mm (6.4 mrad)	0.4 × 6 mm (7 mrad)
Size of bar	17.5 × 35 mm (~6 mrad)	0
Bad focusing	0	~2 mm
Chromatic (wl)	5.4 mrad	~5.4 mrad (timing?)
Transport (bar imperf.)	2-3 mrad	2-3 mrad
Correlated		
Alignment, track param.	1-2 mrad	1-2 mrad

MC Task: to balance uncertainties, to make them of the same size.

To reduce dominant uncertainties in focussing DIRC: uncertainty due to bad focusing should be about $\frac{1}{2}$ of PMT size or less; chromatic uncert. (expected to be dominant?) can be reduced by time measurement.