IFR

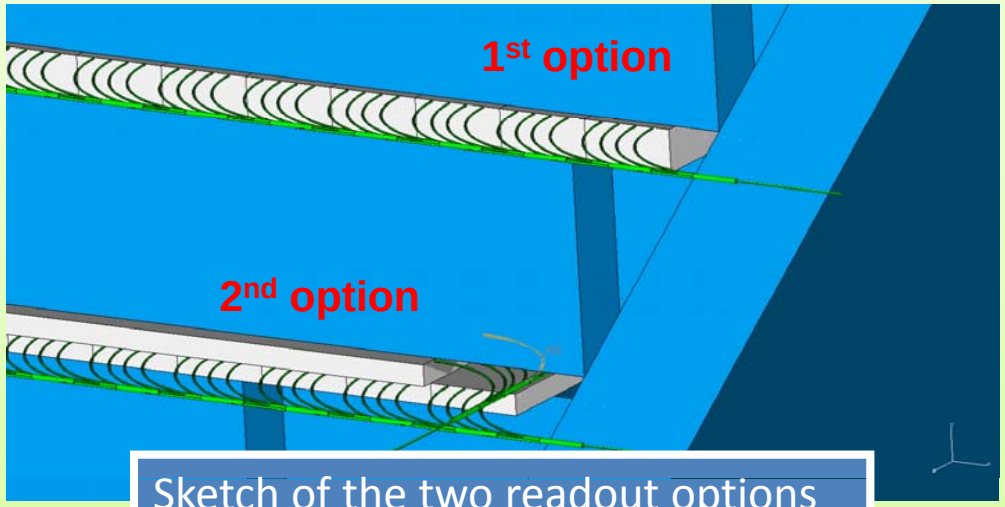
- Major decisions needed and R&D required to make them
- Milestones and timing
- Manpower in place and still required
- Status of WBS planning

Main steps needed toward the TDR

- Evaluate different readout options:

1st option: measure both coordinates with one scintillation bar (position + tiime). This is the baseline.

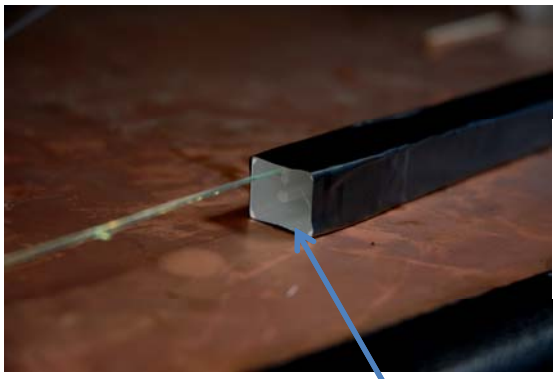
As 2-nd option we are considering the "double coord layout": orthogonal scintillator bars, 1cm thick (mechanically rather complicated)

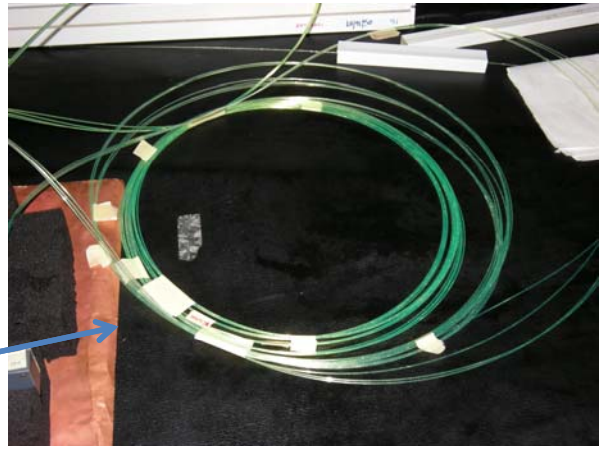


Sketch of the two readout options

- Think about the possibility to bring the photodetectors out of the iron based on the neutron rate: wait for the simulation for final decision.
- Study the space resolution for z-coordinate.
- Evaluate pros and cons of recycling the BaBar iron.

R&D
results and plans

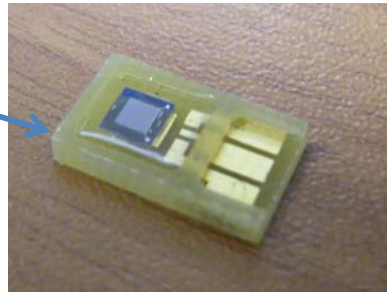


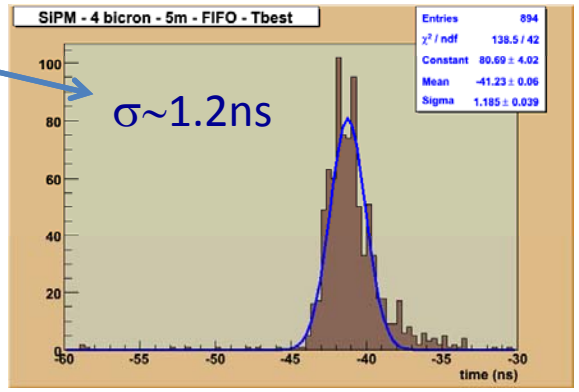


R&D on scintillators, fibers, photodetectors (SiPM/MPPC)

tests focused on the time resolution: latest results show that the CDR resolution (~1ns) is feasible in the worst case scenario.

Tests proceed in parallel with electronics development.





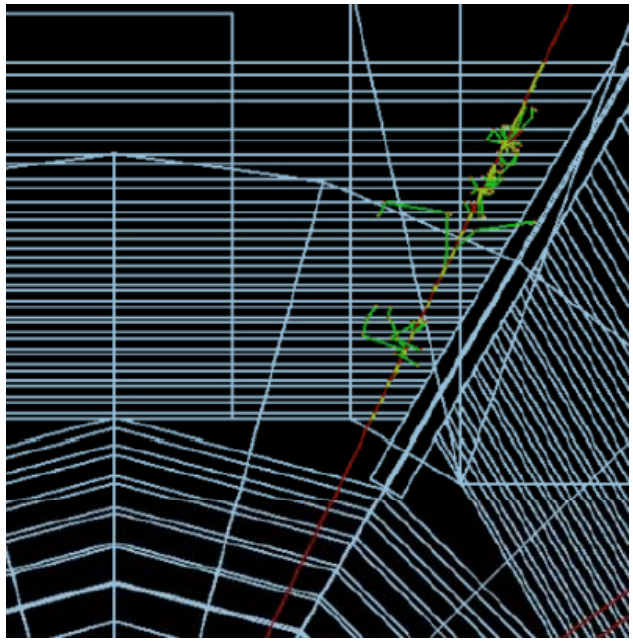
Activities will continue to:

- improve the efficiency of light collection
- test other configurations and options
- optimize the integration between the different parts

Simulation and detector optimization

Detector, parameters that need to be optimized:

- *# of interaction lengths*
- *Spatial resolution, baseline is 4cm x 20cm*
- *Transverse segmentation: better identify the neutral hadrons*



It is not possible to use only the Fast Sim. for the IFR detector optimization:

– The hadronic interaction at low momentum, crucial to $\pi-\mu$ separation need detailed studies

Option 1

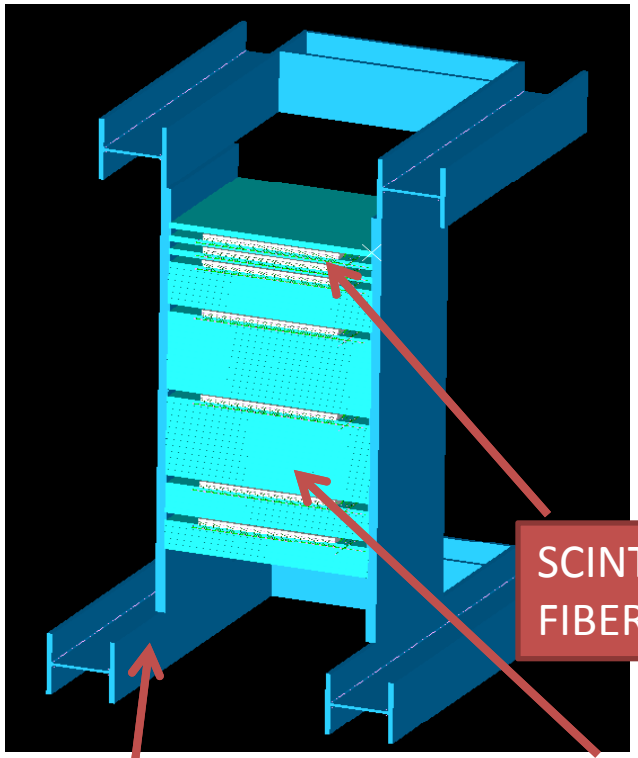
- Use the Full Sim. geometry to study the shape of the hadronic shower in a sampling detector

- Parameterize the shower with a functional form in the Fast Sim.

Option 2

Integrate the output of the Full Sim in the Fast Sim.

Prototype preparation



layout based on:
- 5 layers of x-y scintillators, 1 cm thick, read in binary mode
- 3 layers of scintillators 2 cm thick, read in timing mode

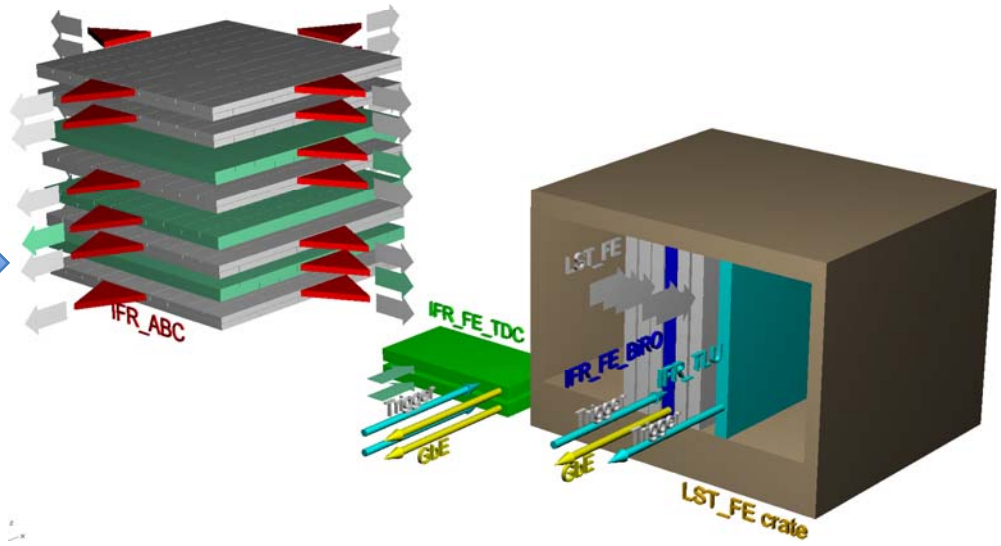
Design of the prototype has started and will be finalized based on R&D and simulation.

Need to place the order for the scintillators by the summer: schedule for simulation is very tight.

Need to identify the beam facility for the tests

Electronics for the prototype is being designed to test different readout options.

Cooling system and other infrastructures to be developed.



Milestones

- Order of dye for scintillator bars (June 2009)
- Final layout of prototype (fall 2009)
- Prototype construction (beginning 2010)
- Beam test (summer 2010)
- Write TDR (end 2010)

WBS	Item
1	IFR(TDR)
1.1	Design Optimization
1.1.1	fast simulation
1.1.2	full simulation development and tools
1.1.3	detector geometry optimization
1.1.4	background studies
1.1.5	write the TDR and cost estimate
1.2	Detector R&D
1.2.1	WLS fiber
1.2.2	scintillators
1.2.3	photon detector
1.2.4	integration
1.2.5	write the TDR and cost estimate
1.3	Mechanics
1.3.1	tech support for R&D
1.3.2	flux return design
1.3.3	detector components design
1.3.4	production/installation tooling design
1.3.5	installation and integration
1.3.6	write the TDR and cost estimate
1.4	Electronics
1.4.1	tech support for R&D
1.4.2	AAD/TDC development
1.4.3	Super B DAQ integration
1.4.4	write the TDR and cost estimate
1.5	Prototype and testbeam
1.5.1	cooling
1.5.2	IFR AAD
1.5.3	IFR FE
1.5.4	IFR_FE_TDC
1.5.5	IFR ONLINE
1.5.6	design prototype mechanics
1.5.7	build prototype and test (cosmic)
1.5.8	test beam
1.5.9	offline code and data analysis
1.5.10	write the TDR
1.6.1	Project management

Physicists manpower (draft) till end 2010

- Required about 92 man-months
- Available (funded) 36 m.m.
- Needed 52 m.m. (manpower with very good expertise exists but needs funding)

Electronics manpower ok

Mechanics manpower not ok (working on it)