

Test Beam models in Mokka

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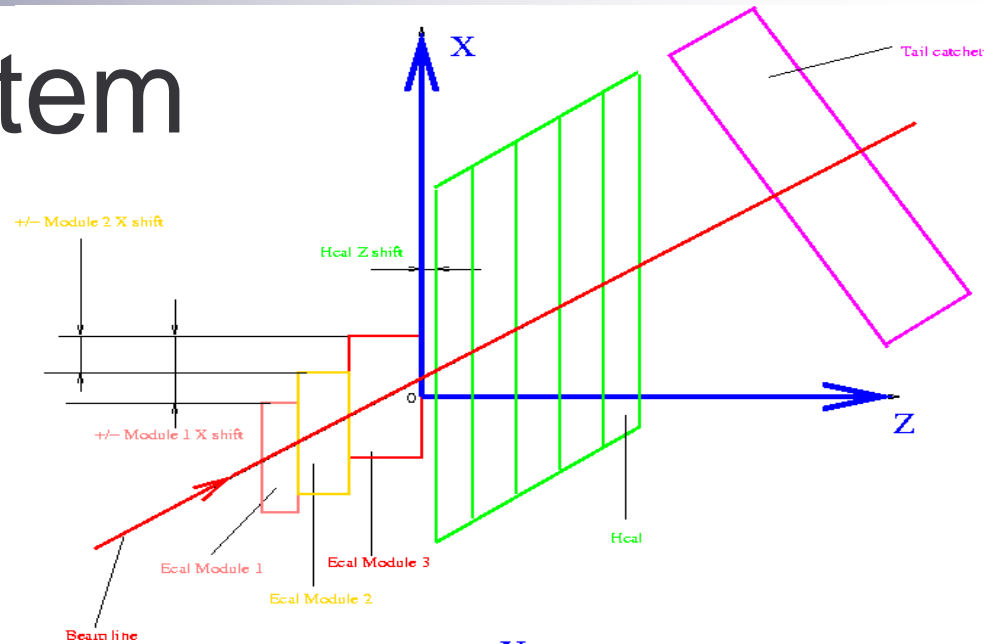


Pre-release of Mokka now available

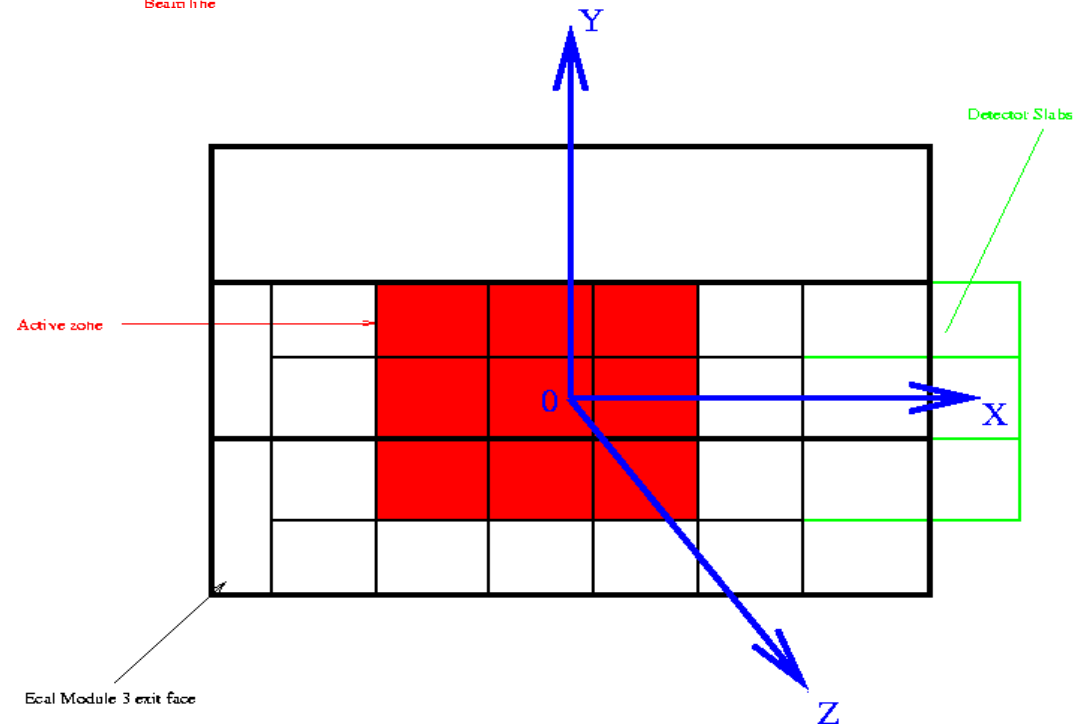
- n A preliminary release of Mokka is now available for download:
Mokka v06-02-pre02
- n There are several improvements in the simulation and all the test beam models for the Desy and CERN test beams are available for first test of MC productions
- n The models are not completely tested, so please report any problem you might experience

Coordinate system

n The $Z = 0$ plane is on the back face of the carbon fiber module 3. Since some of the beam tests are done by using only the Ecal, the coordinate system has to be tied to the Ecal rather than to the Hcal. When testing different angular positions, the modules 1 and 2 are shifted with respect to module 3 along the $\pm X$ axis.

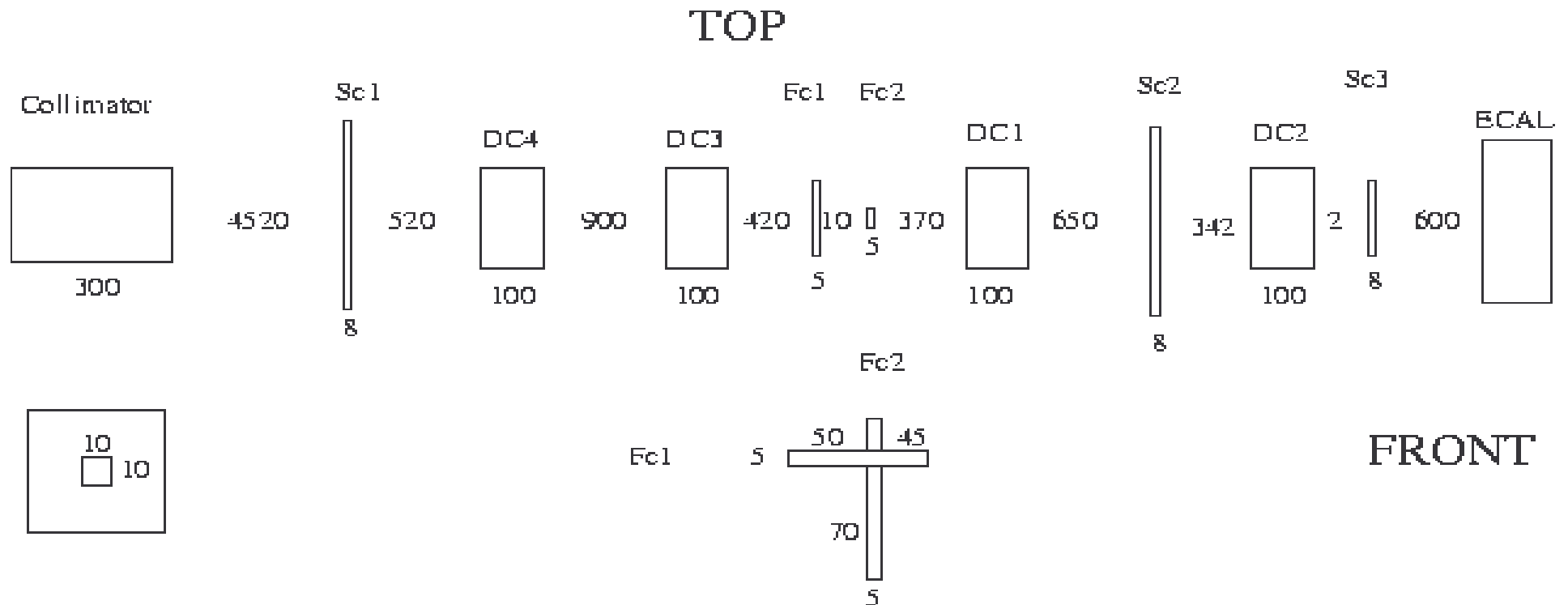


n The (X, Y) origin of the coordinate system is a point on the end face of module 3 that corresponds in Y with the centre of the active area, and in X with the symmetry centre of the end face. The slabs are staggered along the X direction.



Desy 2006 test beam

- Model is complete and has been thoroughly checked



Sc1 and Sc2 are 200x200
Sc3 is 120x120

All distances are in mm



Detector model TBDesy0506 - I

n Drift Chambers (FS):

- α same as for the 05 test beam
- α gas mixture is non-flammable (96% Ar, 4% Ethane)
 - n 4 drift chambers (72x72x88 mm³)
 - n hits written out in LCIO format
 - α To reduce number of hits, only hits with $E_{rel} > 0.001$ are written in output

n Trigger scintillators (FS):

- α 3 scintillators (one 120x120x8 mm³, two 200x200x8 mm³) used in the trigger
- α hits written out in LCIO format
 - n hits simulated as 'calorimeter' hits



Detector model TBDesy0506 - II

n Finger counters (FS):

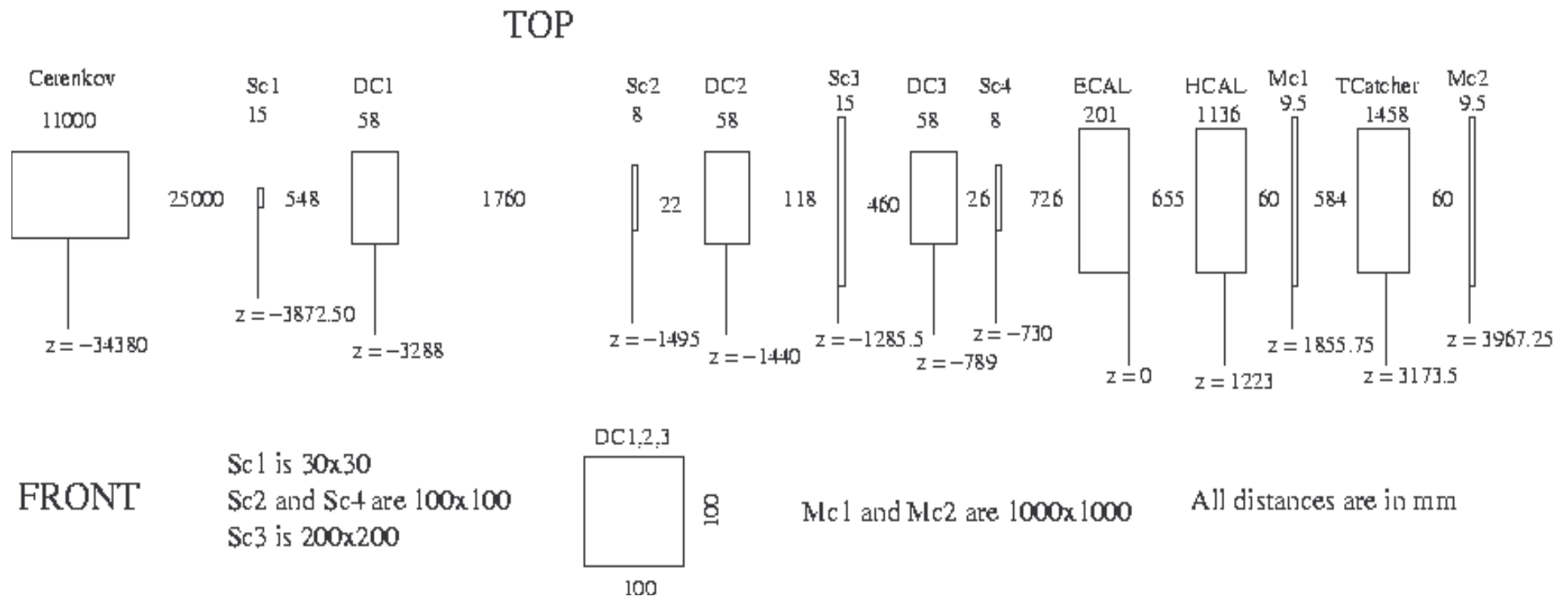
- α 2 scintillators ($5 \times 100 \times 5 \text{ mm}^3$) placed in T shape to monitor beam position
- α hits written out in LCIO format
 - n hits simulated as 'calo'hits

n ECAL (G.Musat):

- α 3 modules (5 slabs)
 - n tungsten thicknesses = 1.4, 2.8, and 4.2 mm.
 - n silicon planes divided into wafers
 - α 6x6 cells ($10 \times 10 \text{ mm}^2$), guard-rings (1 mm width).
 - α Two separate hits collections, one for hits in cells and the other for hits in guard-rings.

CERN Aug 2006 test beam

- n Complete, but HCAL position needs to be checked
 - o Should be 90 mm higher in y
- n ECAL, TCMT and Tracking are OK





Detector model TBCern0806 - I

- n Cerenkov detector (FS): only material is simulated

- n Drift Chambers (FS):

 - α provided by CERN (50% Ar, 50% CO₂)

 - n 3 drift chambers (108x108x44 mm³)

 - n hits written out in LCIO format

 - α To reduce number of hits, only hits with $E_{rel} > 0.001$ are written in output

- n Trigger scintillators (FS):

 - α 3 scintillators used in the trigger (one 30x30x15 mm³, two 100x100x15 mm³)

 - α One veto scintillator (200x200x15 mm³)

 - α hits written out in LCIO format

 - n hits simulated as 'calo' hits

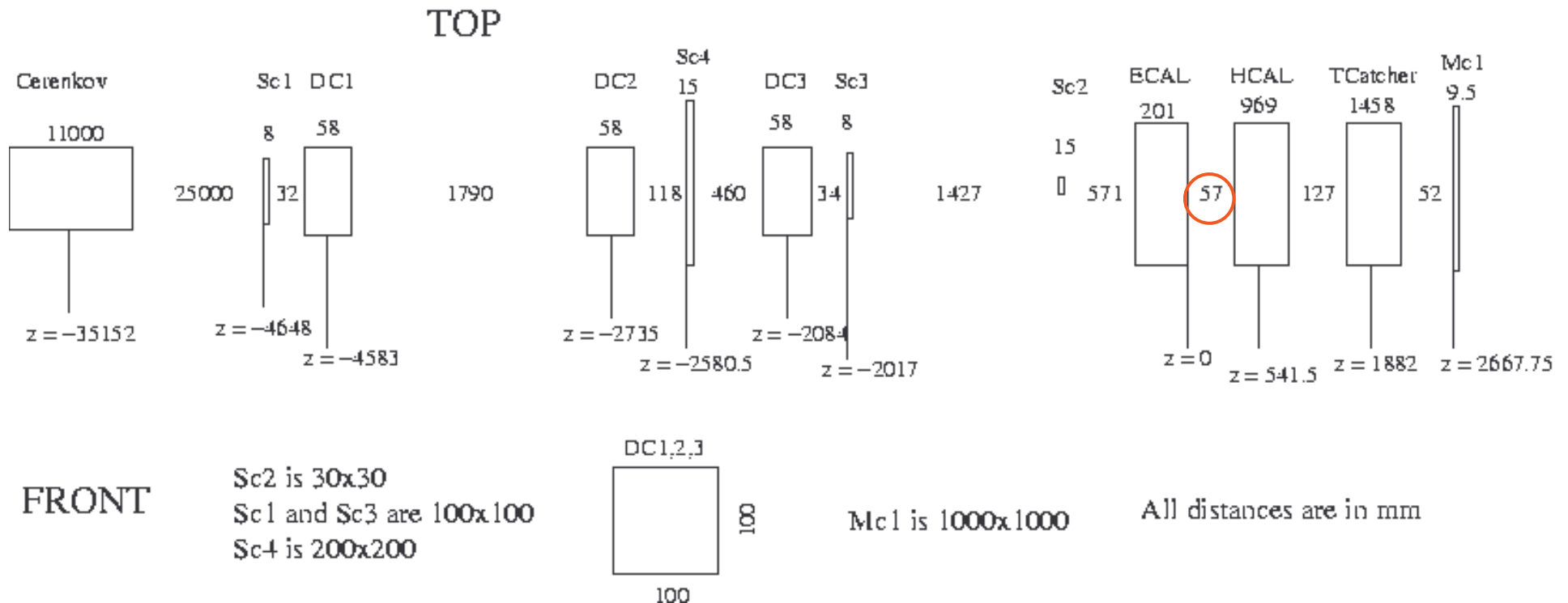


Detector model TBCern0806 - II

- n ECAL (G.Musat): same as for TBDesy0506
- n HCAL (O.Wendt): 35 layers (900x900x30 mm³). Each layer is composed by an iron absorber and scintillating material and is sub-divided into 90x90 mm² cells of 10x10mm²
 - Cell numbering scheme (from lower left corner of each layer)
 - n $i = \text{row}, j = \text{column}, k = \text{layer}$
- n TailCatcher (G.Lima): 16 layers (absorber+air+readout module)
 - 2 different absorber thicknesses (19 mm - layers 1 to 8, 101 mm – layers 9 to 16). Readout modules: 9.5 mm.
 - All absorbers in place, but only 8 readout modules (1,4,7,10 – vertical strips; 2,5,8,11 – horizontal strips). Layers 3,6,9,12-16 have no readout modules and 32mm-thick air gap
- n Muon Counters (FS):
 - 2 scintillators (1000x1000x9.5mm³)
 - n steel (1mm) + plastic scintillator (7.5mm) + steel (1mm)
 - hits simulated as ‘calo’ hits and written out in LCIO format

CERN Oct 2006 test beam

n Complete, but not fully checked yet





Detector model TBCern1006 - I

- n Cerenkov detector (FS):
 - α same as TBCern0806
- n Drift Chambers (FS):
 - α same as for TBCern0806
- n Trigger scintillators (FS):
 - α same as for TBCern0806
- n ECAL (G.Musat):
 - α same as for TBDesy0506



Detector model TBCern1006 -II

- n HCAL (O.Wendt): 30 layers (900x900x30 mm³). Each layer is composed by an iron absorber and scintillating material and is sub-divided into 90x90 mm² cells of 10x10mm² (virtual cell scheme)
 - Cell numbering scheme (from lower left corner of each layer)
 - n $i = \text{row}, j = \text{column}, k = \text{layer}$
- n TailCatcher (G.Lima): 16 layers (absorber+air+readout module)
 - Fully instrumented:
 - n 2 different absorber thicknesses (19 mm - layers 1 to 8, 102 mm – layers 9 to 16). Readout modules: 9.5 mm.
 - n Air gaps are 22 mm thick
- n Muon Counters:
 - 1 scintillator (1000x1000x9.5mm³)
 - n steel (1mm) + plastic scintillator (7.5mm) + steel (1mm)
 - hits simulated as ‘calo’ hits and written out in LCIO format



MOKKA web site

<http://polywww.in2p3.fr:8081/MOKKA>

- n All information about the detector models are kept updated at this site
- n Check for any inconsistency and report any problem
- n Pre-release of Mokka 06-02 is already available for download from this site



Summary

- n Pre-release of new version of Mokka (06-02) is available for download from the Mokka WEB site
- n All test beam models for the 2006 test beams are available
 - o TBDesy0506 - complete and fully checked
 - o TBCern0806 - complete, but some checks are still to be done (e.g. HCAL y position)
 - o TBCern1006 - complete, not yet fully tested
- n Please report any problem you might find when using this pre-release (will speed up the process of a final Mokka release)
 - o Planning to have a final stable release during/just after Valencia