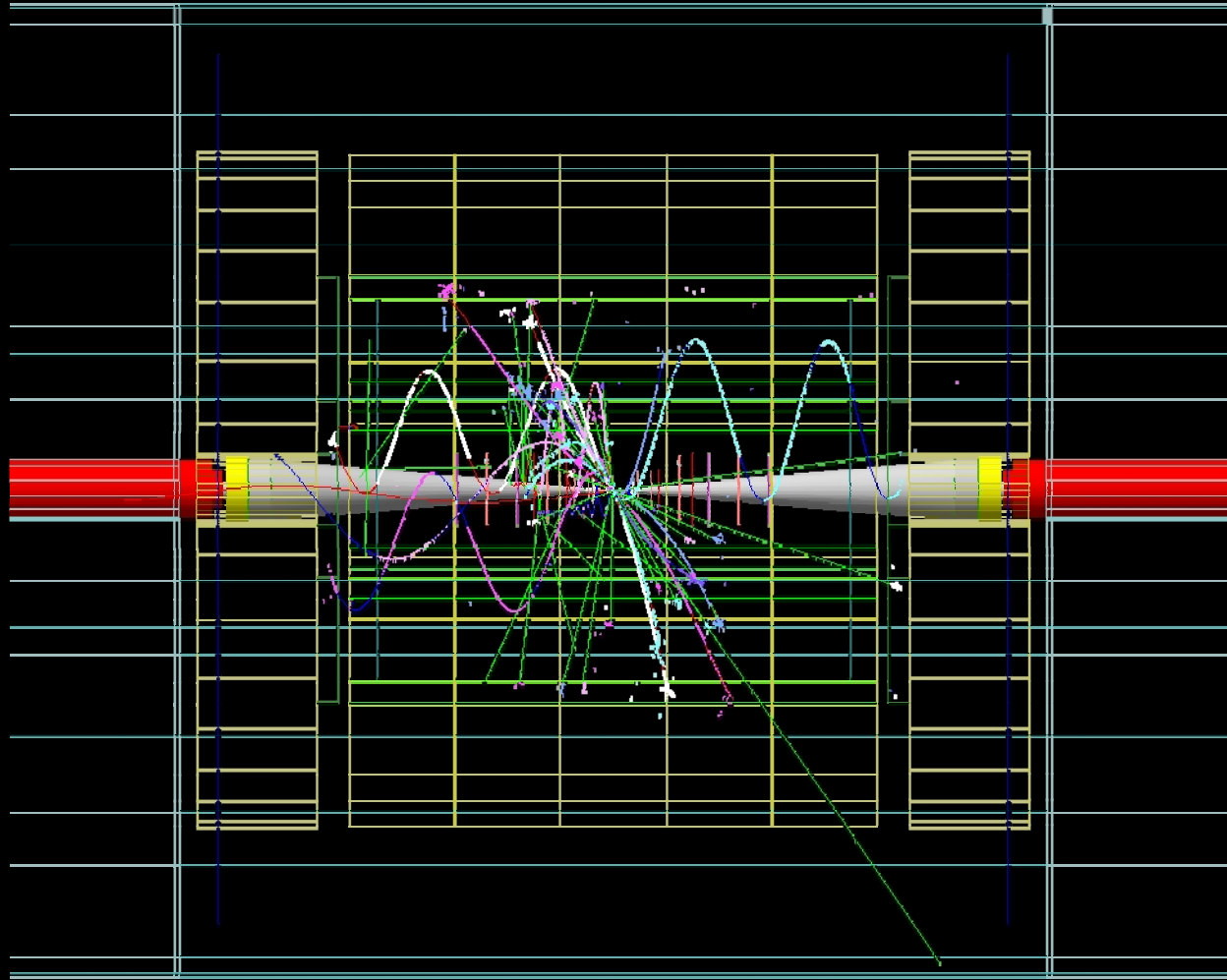


MOKKA - recent developments



Recent developments included in the last two Mokka releases:

- ❑ Mokka 06-01 (released in June 2006)
- ❑ Mokka 06-02-pre02 (released in October 2006)

Mokka-06-01

- Editing the Model geometry at launch time
- First version of MokkaGear
- Changes and extensions of the CGA interface
- Other developments

Editing the Model geometry

■ Two new init commands:

- `/Mokka/init/EditGeometry/addSubDetector subdet build_order`
- `/Mokka/init/EditGeometry/rmSubDetector subdet`

Remarks:

- `build_order` (default 0) concerns sub-detectors built by super-drivers: inner device change propagates to immediately outer device

- users must be sure that the resulting model doesn't have overlaps; better results with superdrivers - adjust key parameters to avoid overlaps

First version of MokkaGear

- While built against GEAR, Mokka creates Gear XML files with the description of the current model
- GEAR env var points to GEAR install directory
- New steering command
 - /Mokka/init/MokkaGearFileName destinationFile
 - (default to GearOutput.xml)
- Not all detectors supported

Changes to the CGA interface

- Allow implementation of Distance and Point Properties in GEAR
- CGAInit reads steering file
- CGAGetSteps and CGAGetVolumeData supply number of interaction lengths
- New methods: CGAGetE, CGAGetB, CGAGetEdl, CGAGetBdl
- New methods for retrieving material name, density, temperature, pressure, list of G4 logical and physical volumes, region name, position in local coordinate frame, etc.

Other developments

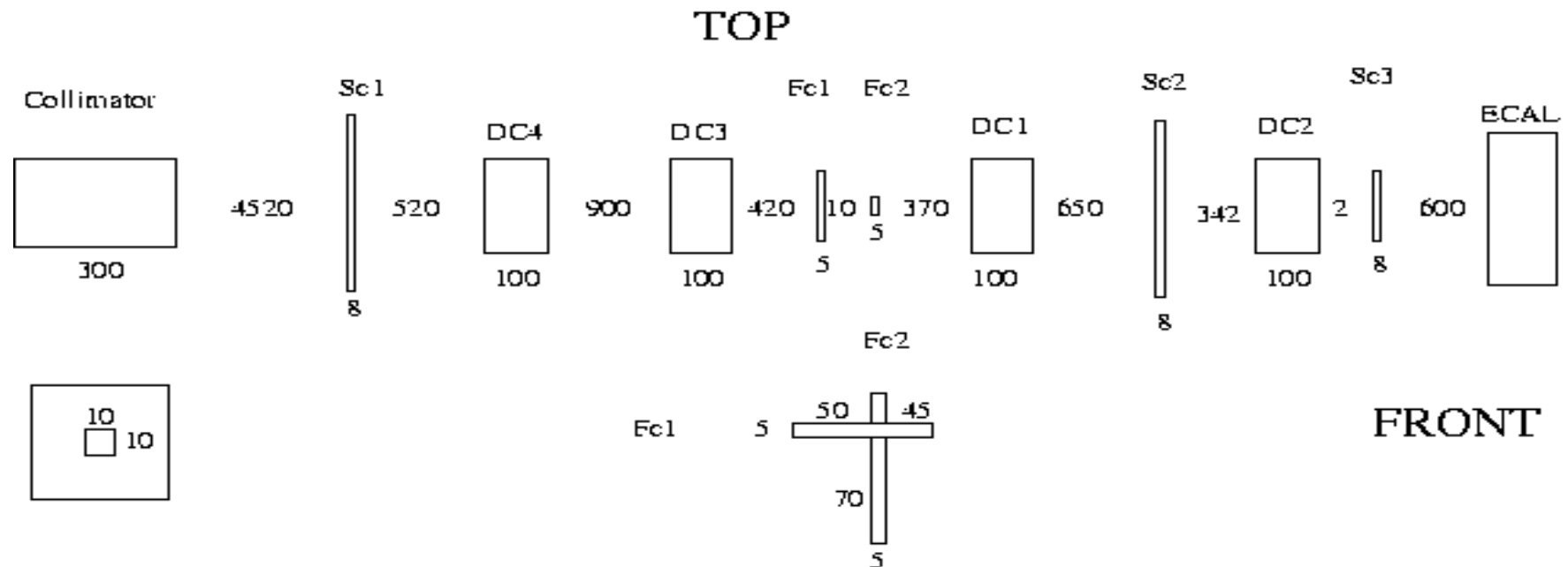
- Monte Carlo truth info stored by default in LCIO file
 - Switch it off with: `/Mokka/init/lcioWriteCompleteHepEvt`
 - Replaces `/Mokka/init/userInitBool WriteCompleteHepEvt true`
- Complete list of particles in HEPEvt ASCII (G4) file copied to LCIO output file
- New `hepevt ASCII Brahms/lund` event files reader

Mokka-06-02-pre02

- DESY and CERN Test Beam models
- Improved material descriptions
- New TPC and Yoke+muon drivers
- Other developments

Desy 2006 test beam

- New model for the simulation of the Desy test beam of May 2006 – TBDesy0506



Sc1 and Sc2 are 200x200
Sc3 is 120x120

All distances are in mm

Detector model TBDesy0506 -I

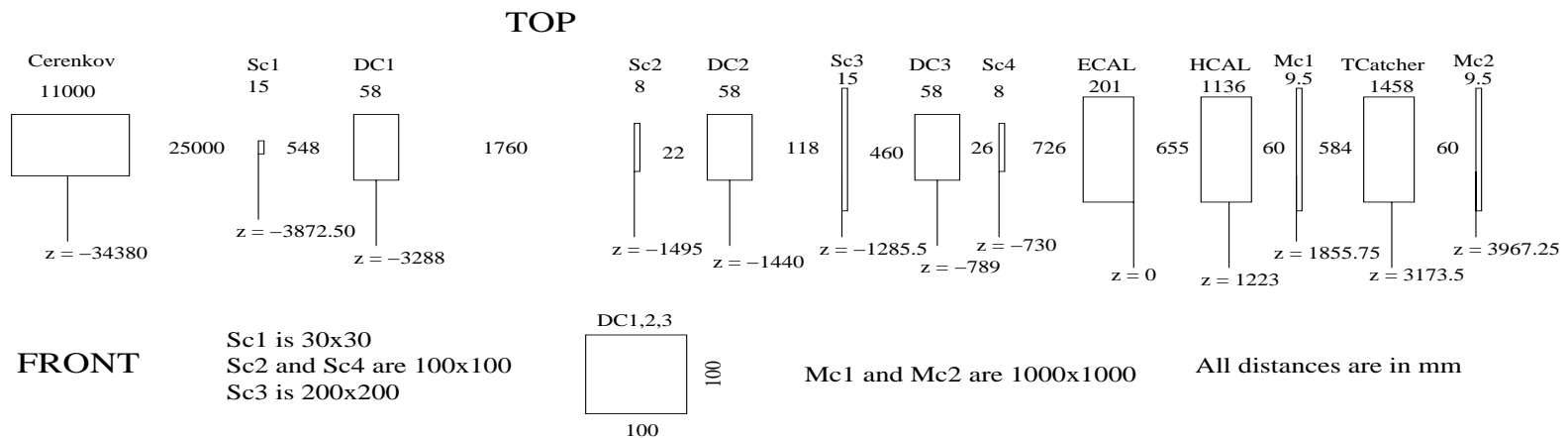
- Drift Chambers (F.Salvatore):
 - installed by our Japanese collaborators for the 05 test beam
 - gas mixture is non-flammable (96% Ar, 4% Ethane)
 - 4 drift chambers (72x72x88 mm³)
- Trigger scintillators (F.Salvatore):
 - 3 scintillators (one 120x120x8 mm³, two 200x200x8 mm³) used in the trigger

Detector model TBDesy0506 -II

- Finger counters (F.Salvatore):
 - 2 scintillators ($5 \times 100 \times 5 \text{ mm}^3$) placed in T shape to monitor beam position
- ECAL (G.Musat):
 - 3 modules (5 slabs)
 - tungsten thicknesses = 1.4, 2.8, and 4.2 mm.
 - silicon planes divided into wafers
 - 6x6 cells ($10 \times 10 \text{ mm}^2$), guard-rings (1 mm width).
 - Two separate hits collections, one for hits in cells and the other for hits in guard-rings.

CERN August 2006 test beam

- New model for the simulation of the CERN test beam setup of August 2006



Detector model TBCern0806 -I

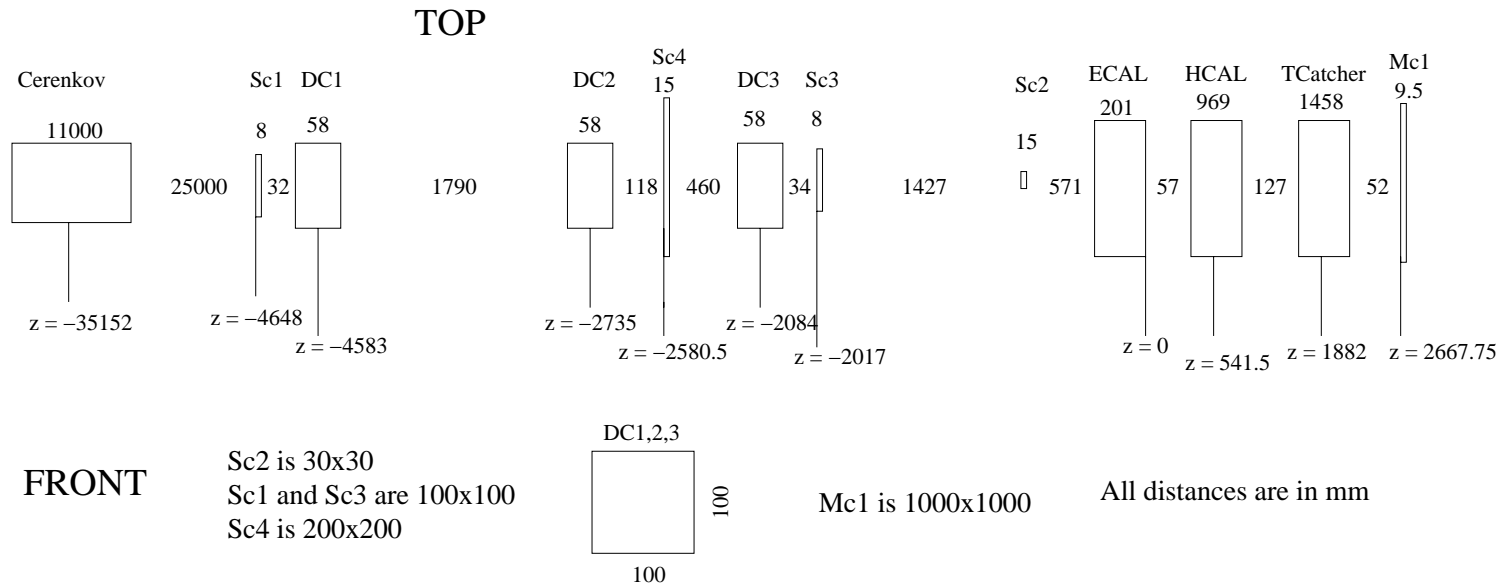
- Cerenkov detector (F.Salvatore):
 - It is upstream of the first trigger scintillator (~25 m)
 - 100x100x11000 mm³, 180μ mylar windows, helium gas
 - Only the material is simulated
- Drift Chambers (F.Salvatore):
 - provided by CERN (50% Ar, 50% CO₂)
 - 3 drift chambers (108x108x44 mm³)
- Trigger scintillators (F.Salvatore):
 - 3 scintillators used in the trigger (one 30x30x15 mm³, two 100x100x15 mm³)
 - One veto scintillator (200x200x15 mm³)

Detector model TBCern0806 -II

- ECAL (G.Musat):
 - same as for TBDesy0506
- HCAL (R.Poeschl, O.Wendt):
 - 35 layers. Each layer is composed by an iron absorber and scintillating material and is subdivided into cells
- TailCatcher (J.McCormick, G.Lima):
 - Added air gaps before and after cassettes
 - DB update: absorber thickness and air gaps
- Muon Counters (F.Salvatore):
 - 2 scintillators (1000x1000x10mm³)

CERN October 2006 test beam

- New model for the simulation of the CERN test beam setup of October 2006 : TBCern1006



Comments

- Desy model: some material on the beam line not yet implemented
 - Collimator: should not be crucial when generating MC events for this setup
- CERN August model: work is still in progress to finalize Hcal:
 - Goetz suggested to raise it by 9 cm on +Y
- Almost ready to start MC production !

Improved material descriptions (A. Vogel)

- Mokka takes advantage of accurate material definitions provided by G4NistManager when possible
- See UI cmds in /material/ directory
- New DB materials02 becomes the default

New TPC driver (Predrag Krstonosic)

- New TPC driver TPC05 inheriting from TPC04 but:
 - Cathode plane in more detail
 - TPC volume divided into two collections: TPCCollection & TPC_skinCollection (2.0cm thick volume on the outer edge of TPC).
 - modification of the `/Mokka/init/lcioDetailedTRKHitMode` command that is now working with collections! and not with drivers
 - to have momentum information in this region (on entry and exit of the TPC active volume) only:
`/Mokka/init/lcioDetailedTRKHitMode TPC_skinCollection`

New Yoke+muon driver (Predrag Krstonosic)

- New driver "yoke03" integrates the yoke and the muon detector
- Inherits from yoke02 with some changes:
 - muon system implemented as a set of rpc layers. Two collections: MuonBarrel & MuonEndCapCollection.
 - additional parameter Yoke_with_plug specifies if the plug is present (must be true for LDC00_xx (TESLA) series otherwise there will be a gap in geometry)
 - if plug is ON, it will have 5 active rpc layers equally distributed along the length of plug. Hits in MuonPlugCollection.
 - for design accuracy the barrel was shortened and the endcap has full radius.

Other improvements in Mokka 06-02-pre02 (I)

- SEcal01 super driver is now available to build the Ecal modules with three different thicknesses for the radiator layer (P.Mora de Freitas)
 - Two new database parameters were introduced:
 - Ecal_nlayers3: Number of layers in the last section of the Ecal (closer to HCAL);
 - Ecal_radiator_layers_set3_thickness: radiator thickness of the last Ecal_nlayers3 layers.
 - Defaults set to 0 (standard models use just two different sets of radiator thickness for the Ecal)
- Run Mokka in Batch Mode (P.Mora de Freitas)
 - /Mokka/init/BatchMode true
 - the users can now launch Mokka in batch mode, without an interactive session
 - If BatchMode is set in the given steering file, Mokka executes just the macro file specified in it and exits

Other improvements in Mokka 06-02-pre02 (II)

- Location of MySQL-related files in Makefile (A.Vogel):
 - Use MYSQL_INCLUDEDIR and MYSQL_LIBDIR
 - Use MYSQL_PATH, if defined (default in v06-01 and before)
 - Use the "mysql_config" tool (if it is in \$PATH)
 - Use "/usr/lib/mysql" and "/usr/include/mysql" as a default
- Improved Error Handling for MySQL NULL Values (A.Vogel)
 - The methods "Database::fetchDouble", "fetchInt", and "fetchString" will now abort with a meaningful error message when they encounter an unexpected MySQL NULL value instead of just crashing with a segmentation fault

Other improvements in Mokka 06-02-pre02 (III)

- Bug fixed in MokkaGEAR output for TPC (F.Gaede, R.Lippe)
 - The values for the pad width and the pad height are now set to zero in order to indicate that the driver makes no assumption about the size of the readout pads
- Added MokkaGEAR Output for Vertex (VXD00+VXD01) (F.Gaede, R.Lippe)
 - Requires GEAR v00-03
 - Writes Gear description for the vertex detector(s) based on a ladder layout
 - For VXD00, 36 ladders are written out to approximate the cylindrical shape
- New plugin: see [Mokka/source/Plugin/JDoePlugin/Readme](#)

The new MOKKA web site

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

The screenshot shows a Mozilla Firefox browser window displaying the Mokka website. The browser's address bar shows the URL <http://polywww.in2p3.fr:8081/MOKKA>. The website features a navigation menu with links for home, members, news, events, detector models, software, database, and download. A search bar is located in the top right corner. The main content area displays a news article titled "Mokka" by Paulo Mora de Freitas, dated 2006-09-07. The article describes a detailed Geant4 simulation for the International Linear Collider detectors. A sidebar on the left contains a navigation menu and a login form. A calendar for September 2006 is visible on the right side of the page.

Mokka
by Paulo Mora de Freitas — last modified 2006-09-07 14:19

A detailed Geant4 simulation for the International Linear Collider detectors

« Mokka » is a full simulation using Geant4 and a realistic description of a detector for the future linear collider. The first basic model was the proposed for the TESLA project, described in details in the TESLA Technical Design Report (T.D.R.). Since 1999 several new detector parts, models and prototypes became also available in the Mokka geometry database. In its last releases Mokka provides several models for both LDC and SiD detector concepts, as well for the calorimeters test beams.

- History and old stuff
- Detector models simulated by Mokka
- Geometry Database
- Documentation for users and developers
- Download Mokka

news

mokka-06-01
2006-07-20
More news...

September 2006

Su	Mo	Tu	We	Th	Fr	Sa
						1 2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

Done

Paulo Mora de Freitas
Gabriel Musat
Fabrizio Salvatore

All info about detector models

The screenshot shows a Mozilla Firefox browser window with the address bar displaying `http://polywww.in2p3.fr:8081/MOKKA/detector-models`. The website header features the Mokka logo and navigation links: home, members, news, events, detector models, software, database, and download. A search bar is also present.

The main content area is titled "Detector models" and includes a breadcrumb trail: "you are here: home → detector models". Below the title, it states: "Models in the Mokka database availables for simulation." The list of models includes:

- [Detector Models](#) by Paulo Mora de Freitas — last modified 2006-09-04 16:59
We describe here some of the actual models in the Mokka database availables for simulation.
- [LDC](#) by Paulo Mora de Freitas — last modified 2006-07-19 17:46
LDC models.
- [SiD](#) by Paulo Mora de Freitas — last modified 2006-07-19 17:52
SiD models.
- [Tesla](#) by Paulo Mora de Freitas — last modified 2006-07-20 11:47
Tesla Models
- [Test beams](#) by Paulo Mora de Freitas — last modified 2006-09-08 15:44

The "Test beams" link is circled in red. On the right side, there is a "news" section with a link to "mokka-06-01" dated "2006-07-20" and a "September 2006" calendar where the 12th is highlighted.

Test Beam models (F. Salvatore)

Test beams — MOKKA - Mozilla Firefox

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http://polywww.in2p3.fr:8081/MOKKA/detector-models/test-beams/test-beams/

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Fabrizio SALVATORE Home Page Test beams — MOKKA

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Test beams

by Fabrizio Salvatore — last modified 2006-09-12 15:03
Contributors: mora, musat

Description of the test beam models that have been implemented in Mokka in spring/summer 2006

Models are available to generate MC events simulating the detectors and beam conditions at the Desy (05/06) and Cern (08-09/06) test beams. These models are called **TBDesy0506** and **TBCern0806** respectively and are described below.

TBDesy0506. A sketch of the test beam area can be found at the following URL:
<http://www.pp.rhul.ac.uk/~calice/fab/TestBeams/DesytbArea.ps>. The coordinate system is left-handed, with the z axis along the beam line. The backside of the ecal defines the z=0 of our setup. The detectors that have been simulated on the beam line (starting from the upstream collimator) are described in the following.

Sc1, Sc2, Sc3: trigger scintillators; dimensions: 200x200x8 mm (120x120x8 mm for **Sc3**). Sc3 is placed between the last drift chamber (**DC2**) and the ECAL module (see sketch of the tb area and below for more description). Sc1 is placed in front of the first drift chamber (**DC4**), 4520 mm after the exit window of the collimator. Hits in the scintillators are simulated as 'tracker hits'. The format of the output from the drivers that build these detector is standard LCIO. In order to output only primary hits, only hits with a deposited energy greater than 0.01 are stored.

DC1, DC2, DC3, DC4: drift chambers; dimensions: 72x72x88 mm. The gas mixture used is 96% Argon and 4% Ethane. The front and back windows (20 micron) are made of mylar. For convention, the drift

news

- mokka-06-01
2006-07-20
More news...

September 2006

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24	25	26	27	28	29	30

Done

The new MOKKA web site

- Information about:
 - Software: documentation, installation guide, user's guide;
 - Database: description of the detector's db;
 - News about MC releases;
 - Download: Mokka and Mokka-related tags
- Work is still in progress.
 - Users can help keeping all relevant information