MUTOMCA Mixer

The **mutomca_mixer** application can merge different root files produced by the track reconstruction of the super layer and drift tube chambers.

Tracks are merged according to the event number defined in the input root files. The output file contains the **TFtree** tree with the following fields:

Branch	Description
evNumber	the event number
m_TF	the slope of the track on the horizontal plane of the DT chamber
q_TF	the intercept of the track on the horizontal plane of the DT chamber
m_VF	the slope of the track on the vertical plane of the DT chamber
q_VF	the intercept of the track on the vertical plane of the DT chamber
m_SL	the slope of the track on the vertical plane of the SL
q_SL	the intercept of the track on the vertical plane of the SL

Installation

The required environment is describe in the guide.

The mutomca_mixer is available in baltig:

```
git clone https://baltig.infn.it/andreett/muotom-tools
```

The code can be built with the following statements:

```
cd muotom-tools
mkdir build
cd build
cmake -DCMAKE_INSTALL_PREFIX=/usr -DCMAKE_BUILD_TYPE=RelWithDebInfo ..
make
sudo make install
```

Configuration

The only command line option required by the application is the path of a configuration file. The configuration file is a INI-file containing the following sections and parameters:

```
write_all_events = true

sl_dt_hdist = 229.0
sl_dt_vdist = 520.0

sl0_file = sl0_data.root
sl1_file = sl1_data.root
dt0_file = dt0_data.root
dt1_file = dt1_data.root
main_file = mixed_data.root
```

- Section main

Variable	Type	Description
write_all_events	*string*	If true the mixer writes all the events even if there're no matches, otherwise only events with references for both the coordinates are considered

- Section geom

Variable	Type	Description

sl_dt_hdist	*float*	It's the distance (in mm.) between the reference plane for the SL and the reference plane of the Drift Tube chamber of a MUTOMCA detector
sl_dt_vdist	*float*	It's the vertical displacement (in mm.) between the SL and the DT chamber

- Section IO

Variable	Type	Description
sl0_file	*string*	It's the path of the root file containing the tracks of the super layer on the right of the Castor
sl1_file	*string*	It's the path of the root file containing the tracks of the super layer on the left of the Castor
dt0_file	*string*	It's the path of the root file containing the tracks of the drift tube chamber on the right of the Castor
dt1_file	*string*	It's the path of the root file containing the tracks of the drift tube chamber on the left of the Castor
main_file	*string*	It's the path of the root file with all the merged tracks

Execution

The application can be run with

```
mutomca_mixer --conf=<path of the configuration file>
```