

Local To Global Reference Frame

The local2globalRF script is transforming the tracks reconstructed by the DTF software and the PattRec software (mixed with mutomca_mixer) from the local reference frame of the DT detector to the global reference frame (same as MC simulations, centered in the cask).

The output file contains the tree muCastorMC tree with a CastorSkinHits branch having a similar structure of the OpenCMT Castor simulation file.

Installation

The required environment is describe in the [guide](#).

The local2globalRF is available in [baltig](#):

```
git clone https://baltig.infn.it/muontomography/python-muotom-utils.git
```

under the folder **src**.

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:

```
[geom]
theta0 = 0
theta1 = 180
dist = 3535
shift = 96.5
corrM_DT1 = 0
corrQ_DT1 = 0
corrM_SL1 = 0
corrQ_SL1 = 0

[IO]
is_MC = 0
chunk = 0
main_file = mixed_data.root
output_file = SkinHits.root
```

- Section geom

Variable	Type	Description
theta0	float	DET0 rotation (deg) in the global reference frame
theta1	float	DET1 rotation (deg) in the global reference frame
dist	float	Distance (mm) between the center of the two DT detectors
shift	float	Vertical shift (mm) between the center of the DT detectors and the cask center
corrM_DT1	float	Misalignment correction factor for angular coefficients of tracks reconstructed by DT1 with respect to DT0
corrQ_DT1	float	Misalignment correction factor for intercept of tracks reconstructed by DT1 with respect to DT0
corrQ_SL1	float	Misalignment correction factor for angular coefficients of tracks reconstructed by SL1 with respect to SL0
corrQ_SL1	float	Misalignment correction factor for intercept of tracks reconstructed by SL1 with respect to SL0

- Section IO

Variable	Type	Description
is_MC	<i>bool</i>	1 for MC simulations, 1 for data
chunk	<i>int</i>	(only for MC) Number of subsets in which dataset is divided to be processed (to avoid combination of repeated evNumber)
main_file	<i>string</i>	Input file (mixed data) with path
output_file	<i>string</i>	Output file with path

Execution

The application can be run with

```
python local2globalRF.py --conf=<path of the configuration file>
```