

New software for the R³B calorimeter CALIFA within FairRoot*

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Introduction

R³B is a next generation experimental setup for studies of Reactions with Relativistic Radioactive Beams. Its aim is to provide a versatile reaction setup for kinematically complete measurements of reactions with high-energy radioactive beams [1]. CALIFA, the R³B CALorimeter for In-Flight emitted pArticles detection, is one of the key detectors for the setup of R³B.

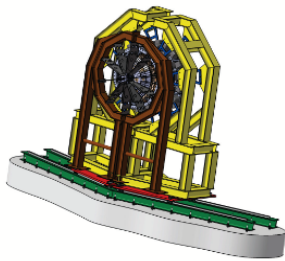


Figure 1: CALIFA calorimeter in last year report [2].

As CALIFA is included in the R³B experiment, the software requirements will be handled by the FairRoot framework.

CALIFARoot

The framework FairRoot provides base classes which enable the users to construct their detectors and tasks in a straight-forward way [3]. Two important parts of the software for CALIFA have been developed for the framework: the unpacker and the raw-data publisher. Both of them will be fully explained in the next sections.

CALIFA unpacker

The unpacker is the element that allows us to extract the information obtained via the data acquisition system and save it in ROOT format. In order to create the unpacker for CALIFA we need three essential elements: a representation of a hit in one of the crystals, the unpack code to fully read the information obtained and to extract it, and a macro that provides information regarding how the unpacker will be handled and creates the ROOT file with the resulting data and histograms.

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CALIFA raw-data publisher

The raw publisher, fully based on a javascript code called JSRootIO [4], is an useful feature for experiments that involve different institutes, as it allows them to start live analysis while the experiment is still running.

In order to do this, a webpage is generated and has to be uploaded to a server, along the ROOT file where the data shown is taken from. Two elements are necessary: the generator of the web file and code to add the histograms to the ROOT file that can be read with the javascript code. The webpage is currently able to use the javascript code both via an external link and with a local deployment, downloading the required files in the server.

Conclusion

Basic tools for CALIFA have been developed during the year 2013. Extended software, like database infrastructure, is expected to be developed during the year 2014.

References

- [1] R³B collaboration, <http://www.gsi.de/R3B>
- [2] R³B collaboration, "Status of the CALIFA/R³B calorimeter", GSI Scientific Report 2012 (2013) 198
- [3] FairRoot, <http://fairroot.gsi.de/>
- [4] JSRootIO, <http://root.cern.ch/js/>