



Contribution ID: 10

Type: **Presentation**

## Object oriented data analysis at the BGO–OD experiment

*Friday 18 September 2015 15:00 (20 minutes)*

The BGO–OD experiment at the ELSA accelerator facility at Bonn is built for the systematic investigation of meson photoproduction in the GeV region. It uniquely combines a central, highly segmented BGO crystal calorimeter covering almost  $4\pi$  in acceptance and a forward magnetic spectrometer complemented by time of flight walls.

Object orientation is a requirement from the beginning to handle the diverse set of involved detectors. As a consequence, starting from the assembly of the event-based data during acquisition up to the level of physics analysis,

ROOT-based datastructures are in heavy use.

All analysis steps are performed with the framework ExPIORA based on ROOT which is optionally complemented by an event generator, Geant4, Geant-VMC, VGM and Genfit2 for monte carlo studies, geometry description and trackfitting.

ExPIORA follows the principles of a plugin and container based data analysis. It offers both a consistent interface structure for plugin development in C++ and a versatile and performant XML-based configuration language which abstracts all steps from filtering the data up to the visualization with histograms or an event-display.

The very portable analysis software can interface with several SQL databases, is subject to continuous testing and supports the developer with a large set of customized warnings facilitated by the reflection mechanisms offered by ROOT.

Successive analysis and levels of data reduction are facilitated by making use of persistent references and a custom pruning procedure.

The framework is complemented by a set of Qt-ROOT based applications for specialized simulations and data calibrations.

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**Session Classification:** Presentations

**Track Classification:** Presentations