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# RICH Software Alignment and Calibration

## Introduction

This activity is coordinated by Antonis Papanestis and Chris Jones. It encompasses all software aspects of detector alignment, calibration and high level monitoring, including algorithms, implementation, and database requirements.

## Alignment of RICH mirrors

- RICH mirror alignment monitoring via software (Online and Offline) by the use of real data (Bristol)

## Calibration and Alignment Strategies

Various aspects of RICH calibration and alignment have been studied at the conceptual level.

- Mirror alignment with data. Most recent presentation (Antonis, June '05 [↗](#)); Antonis note (LHCb-2001-141 [↗](#)).
- Refractive index calibration with data. Andrew Pickford note (LHCb-2002-070 [↗](#)).
- Strategies for correcting for HPD B-field distortions.(Ann van Lysbetten 2004 conference talk [↗](#)).
- Measurement of PID performance with real data. Presentation by Raluca Muresan in the April '06 GPID meeting [↗](#); Raluca Muresan [↗](#) in June 2005.
- ROOT based software package for performing PID studies with MC and collision data

These were summarised at May 2005 LHCb software week meeting [↗](#).

## Conditions Database

How to extract information from the reconstruction databases (DDDB & LHCBCOND)

The RICH requirements for the Conditions Database and a list of Conditions can be found in RICHCondDBdraft.doc

## RICH MACE - Monitoring, Alignment and Calibration Environment

The RICH MACE should provide machinery and resources for gathering, monitoring, storing and retrieving all necessary conditions relevant to the LHCb RICH1 and RICH2 detectors. Its software parts will run on top of other LHCb-wide software systems, e.g. PVSS [↗](#), Conditions Database, etc. or inside RICH Reconstruction components [↗](#), etc.

The attached RICH MACE specification draft is an evolving document. Its main ideas (beyond the included into it Rich Conditions Document) were presented in Report on conditions DB work (on behalf of Anatoly) [↗](#) by Antonis at the March 2006 LHCb meeting.

In version 2.4 RICH Conditions Tables were revised (together with Sajan and Antonis). Simple performance estimates were made and some optimization ideas proposed. This was presented during the LHCb week 29

May 2006: Performance considerations for CondDB [↗](#)

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AnatolySolomin - 02 June 2006

## Internal Milestones

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GuyWilkinson - 18 Jul 2005

- RICHCondDBdraft.doc: Rich Conditions Document
  - RICH\_MACE\_spec\_2.5.odt: RICH MACE specification draft (OpenDocument format)
  - RICH\_MACE\_spec\_2.5.pdf: RICH MACE specification draft (PDF)
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