

Minutes of the 1rd meeting of the ILD alignment task force

14.5.2009, per WEBEX

Present: Ties Behnke, Takeshi Matsuda, Rita de Masi, Aurore Savoy-Navarro, Dan Peterson, Ron Settles, Yasuhiro Sugimoto, Marcel Vos

1. Introduction

Ties showed a few slides as an introduction into the problem and the proposed work of the group. Alignment as understood by this group concerns the relative alignment in space of parts within a subdetector, and, primarily, between subdetectors. Alignment should not be confused with calibration, which is a separate issue.

2. Tasks

The different tasks were discussed from the inside to the outside.

Vertex detector: Alignment of the ladders and relative alignment of the detector will be done based on data. A first estimate exists how much data are needed to reach a good alignment. Rita will study this and update it to reflect the current geometry, in particular the double layer geometry.

Silicon tracking: The Silicon tracking detector system envisions a laser based alignment system. Laser beams will be steered into the ladders, and detected by them. This will – similar to the way alignment is done at Atlas and CMS – allow the beam-independent alignment of the Si detector. However not all possible distortions will be seen by the laser system. The SILC group will draft a note describing the laser alignment system, and explaining its goals and limitations.

The point was raised who this system could be used to align the outer silicon based detectors to the rest of the Silicon system, and whether this system could be used to align the TPC overall relative to the silicon detector. This will be investigated.

Aurore will take on the questions of the alignment of the external systems, while a discussion with the experts in the TPC group will be held to understand the feasibility of the laser alignment for the TPC.

Data will also play a central role in the alignment of the system. Marcel Voss will try to explore how this can be used most efficiently, and develop an overall alignment strategy.

TPC: The TPC for the purpose of the alignment study is assumed to be internally calibrated at the level of 30 μm . Ron and Dan will investigate whether in view of the new tighter momentum resolution goals this is still sufficient.

Internally the alignment of the TPC is a big project on its own. This will be attacked by the TPC group. In particular the questions of the magnetic field and the homogeneity will need to be addressed once more. Currently work is under way to implement a correct version of the magnetic field in the simulation, which might be useful in studying the impact of misalignments in the TPC.

Next meeting: the next meeting will be scheduled for the week of May 25.