



COMPASS NOTE

MODIFICATION OF H1

Authors:

A. Duedder, J. Bernhard, N. du Fresne v. H., E.-M. Kabuss, M. Wilfert
Institut für Kernphysik, Johannes-Gutenberg Universität Mainz

Date:

July 17, 2013

1 Introduction

In 2010, two new hodoscopes (H1 and H2) [1] were installed in the large angle spectrometer part of COMPASS to enlarge the muon trigger acceptance towards large Q^2 . Each hodoscope consists of horizontal scintillator slabs read out on both sides with photomultiplier tubes. The central hole in the hodoscopes is defined by the acceptance of the small angle spectrometer.

H1 consists out of 32 scintillator slabs of the dimension $230\text{ cm} \times 6\text{ cm} \times 1\text{ cm}$. Thus the overall dimension is $2300\text{ mm} \times 1929\text{ mm}$. To obtain stability the scintillators are packed in five groups covered with Rohacell. In the hole of H1 air light guides were installed to guarantee double side readout. The air light guide was 40 cm long and 24 cm high, shifted by 5 cm towards Jura side.

For the DY run in 2014 and the DVCS run in 2015/2016 H1 had to be modified for several reasons. First, the target displacement required a larger vertical hole. Second, to detect μ^+ and μ^- in DY measurements with the same efficiencies, a symmetric air light guide arrangement is needed. The modification took place in September 2012.

2 Modification

The hole was increased to a width of 50 cm and a height of 37 cm which can be seen in Fig.1. For the modification, the central group was replaced. Thus, to access the central group the two upper groups had to be dismantled. The modified central group consists of six scintillator slabs. The hole was increased by two vertical strips so that all six slabs need an air light guide. This air light guides are made of a high reflection plastic foil (Daylight foil from 3M). This foil was folded to a box where the scintillators were inserted on both sides.

To obtain the width of 50 cm in horizontal direction, new scintillators (BC 408 from Saint Gobain) were used. Now the six central elements consist of a 90 cm long scintillator, the 50 cm long air light guide and another 90 cm long scintillator. In the old arrangement 100 cm long scintillators, a 40 cm long air light guide and a 90 cm long scintillator were used. A detailed explanation of the modifications (German) can be found in the bachelor-thesis of Andreas Duedder [2].

During the thesis work it was shown that, contrary to rumours spread in 2011, H1 was correctly assembled in 2010.

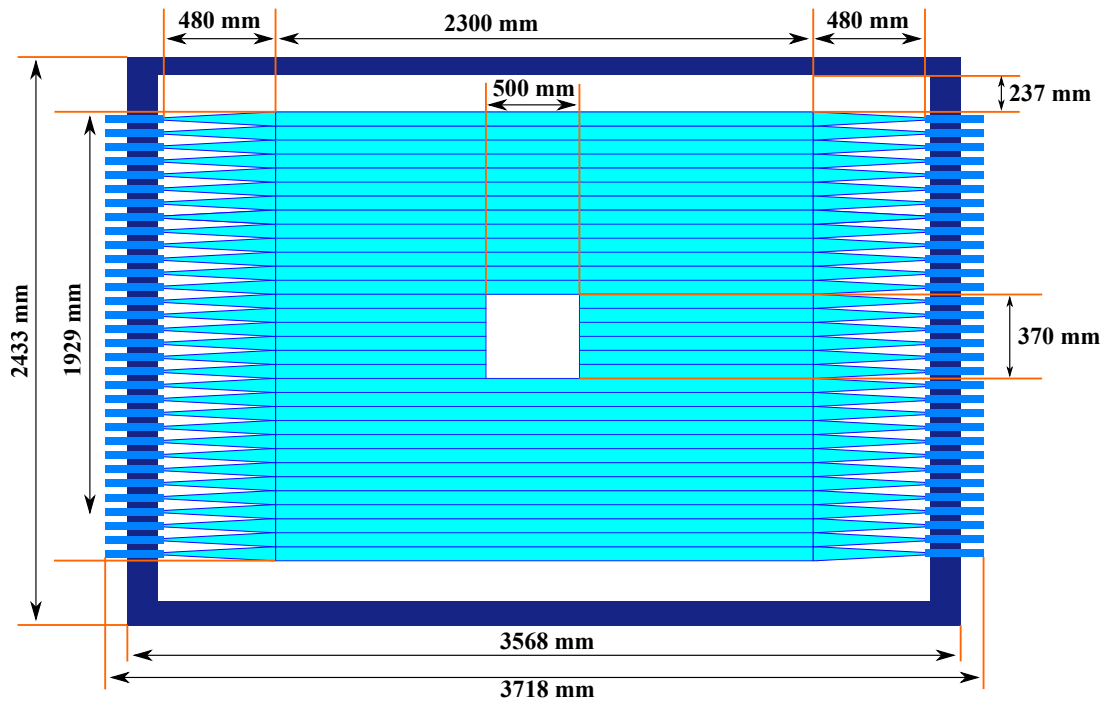


Figure 1: Sketch showing the dimensions of H1

References

- [1] *Technical Summary Of The Large Angle Spectrometer Trigger*, N. du Fresne, COMPASS-Note, 2011
- [2] *Umbau des Large Angle Spectrometer Triggers*, A. Duedder, Bachelor-Thesis (German), 2012