

Status of DHC TDR

5th SuperB Collaboration Meeting

Pisa Sep 2012

Contents

7 Drift Chamber		109
7.1 Overview	- Finocchiaro, Roney 10 pages	109
7.1.1 Physics Requirements	- 3 pages	109
7.1.2 Geometrical Constraints		109
7.1.3 Machine Background Considerations	- Cenci 3 pages	109
7.1.4 DCH Design Overview	- 2 pages	109
7.1.5 Expected Performance	- 2 pages	109
7.2 Design Optimization	- Finocchiaro, Hearty, Piccolo, Roney 9 pages	110
7.2.1 Cluster Counting		110
7.2.2 Cell Design and Layer Arrangement		110
7.2.3 Gas Mixture		112
7.2.4 R&D and Prototype Studies		113
7.2.4.1 Prototype 1		113
7.2.4.2 Prototype 2		113
7.2.4.3 Single Cell Prototype(s)		117
7.2.4.4 Aging studies: fields, gas gain		117
7.2.5 R&D Future Developments		117
7.3 Mechanical Design		117
7.3.1 Endplates		118
7.3.2 Inner cylinder		118
7.3.3 Outer Cylinder		118
7.3.4 Choice of wire and electrostatic stability		119
7.3.5 Feed-through design		119
7.3.6 Endplate system		119
7.3.6.1 Supports for on-detector boards		119
7.3.6.2 Cooling		119
7.3.6.3 Shielding		119
7.3.7 Stringing		119

Contents

7.4	Electronics	- Felici, Martin 1 page	119
7.4.1	Design Goals		119
7.4.2	Standard Readout - charge measurements specifications		119
7.4.2.1	Resolution		119
7.4.2.2	Dynamic range		119
7.4.2.3	Linearity		119
7.4.3	Standard Readout - time measurements specifications		119
7.4.3.1	Resolution		120
7.4.3.2	Dynamic Range		120
7.4.3.3	Linearity		120
7.4.4	Standard Readout - DCH Front-end system (block diagram)		120
7.4.5	Standard Readout - ON-DETECTOR electronics		120
7.4.5.1	Very Front End Boards		120
7.4.6	Sampled Waveforms - specifications		121
7.4.6.1	Resolution		122
7.4.6.2	Dynamic range		122
7.4.6.3	Linearity		122
7.4.7	Sampled Waveforms - DCH front-end system (block diagram)		122
7.4.8	Sampled Waveforms - ON DETECTOR electronics		122
7.4.8.1	Very Front End Boards		122
7.5	High Voltage system	- Martin 1 page	122
7.5.1	HV distribution boards - Standard ReadOut		122
7.5.2	HV distribution boards - Sampled Waveforms		122
7.6	Gas system	- Roney 2 pages	123
7.7	Calibration and monitoring	- Roney 3 pages	123
7.7.0.1	Slow control systems		123
7.7.0.2	Calibration		123
7.7.0.3	Gas monitoring system		123
7.7.0.4	On-line monitor		123
7.8	Integration	- Hearty, Lauciani 6 pages	123
7.8.1	Overall geometry and mechanical support		123
7.8.2	Cable supports and routing		123
7.8.3	Access		123
7.8.4	Gas system		123
7.8.5	Off-detector electronics crates		123
7.8.6	High voltage crates		123
7.8.7	Installation and alignment	- Pisa	123

Status

Phase?

- TDR chapter reviewer identified (R. de Sangro)
- Intense work in the next few weeks to complete writing
 - DCH meeting on Oct. 10th to review status of DCH chapter
- Some studies are being completed, e.g. on the endplate geometry optimization, and will be included in the text
- We intend to present Cluster Counting as a baseline option, not as an upgrade