

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		123

Status

- TDR chapter reviewer identified (R. de Sangro)
- Intense work in the next few weeks to complete writing
- 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 possible (baseline?) option, not as an upgrade