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DØNote 3499 extension

Another Update to the DØGStar Geometry Description of the Central Muon Upgrade Detector

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1 Introduction

The central muon upgrade detectors includes the 94 WAMUS proportional drift tubes, the 630 small Aϕ scintillation counters, and the 360 Cosmic Cap and Cosmic Bottom scintillation counters. These systems are described in detail in the Technical Design Report (TDR)[1].

The GEANT simulation of the upgraded DØ detector is called DØGStar [2]. The geometry of the central muon system was updated last year [3]. The geometry of some "Cosmic Bottom" scintillation counters was not known at that time. Now it is (better) known.

1.1 Changes to Description of Cosmic Bottom Counters and their PDT's

We added an 8th ("Wing") scintillation counter to the CF Bottom B volumes BSX8. It was done in-keeping with Sirotenko's "ideology"[4], which is to attach counters to the PDT's in such a way that, should the PDT move, then so does the counter. This sounds simple enough; however, the 8th counters extend well past the edge of the PDT's on which they are mounted. Thus it was required to increase the size of BMX8 to accomodate the new counter and shift the PDT's (BPX8) within the volume. The X positions of BPX8 are shifted 20.635 cm toward $X = 0$. This could have been done in a more straight-forward way.

The four CFB hole counter design was finalized and those counters are being installed on the underside of the centerbeam as I write this. These are implemented in DØGStar as BPZ7's within BSX9 within BMX9. These counters are mounted directly to the magnet; therefore, BMX9 doesn't contain any PDT's.

Figure 1 shows the plan view of the new geometry of the Cosmic Bottom. It was made by artificially increasing the thickness of the counters so that one DCUT could show them all.

The EFB scintillation counters actually extend further in $|\hat{z}|$ then the PDT's on which they are mounted. The DØGStar geometry was modified to reflect this by enlarging BMX1 and creating BMXA, similar to BMX1, and BSX1 to the new size. The PDT volumes BPX1 were shifted 9.12902 cm. towards smaller $|\hat{z}|$.

The CFC bottom scintillation counters were moved from the top-side of the PDT's to the underside. The CFC Bottom PDT's (CMX1) were shifted up by 3/8" to reflect the installation procedure.

Figure 2 shows an elevation view of the new geometry.

2 Summary

We have modified and improved the central muon D0Gstar geometry to the present best understanding of the ultimate detector positions. This should be checked and updated in about one year.

References

[1] B. Baldin *et al.*, "Design of the Central Muon System", DØNote 3365 Revision 3/12/98, March 1997.

[2] Yuri Fisyak and John Womersley, "DØGStar Manual", DØNote 3191 Revision A, September 3, 1997. This information is also available at URL http://www-d0.fnal.gov/newd0/d0atwork/computing/MonteCarlo/MonteCarlo.html.

[3] B. S. Acharya and H. T. Diehl, "Update to the DØGStar Geometry Description of the Central Muon Upgrade Detector", DØNote 3499, April 1998.

[4] V. Sirotenko, private communication, 1999.

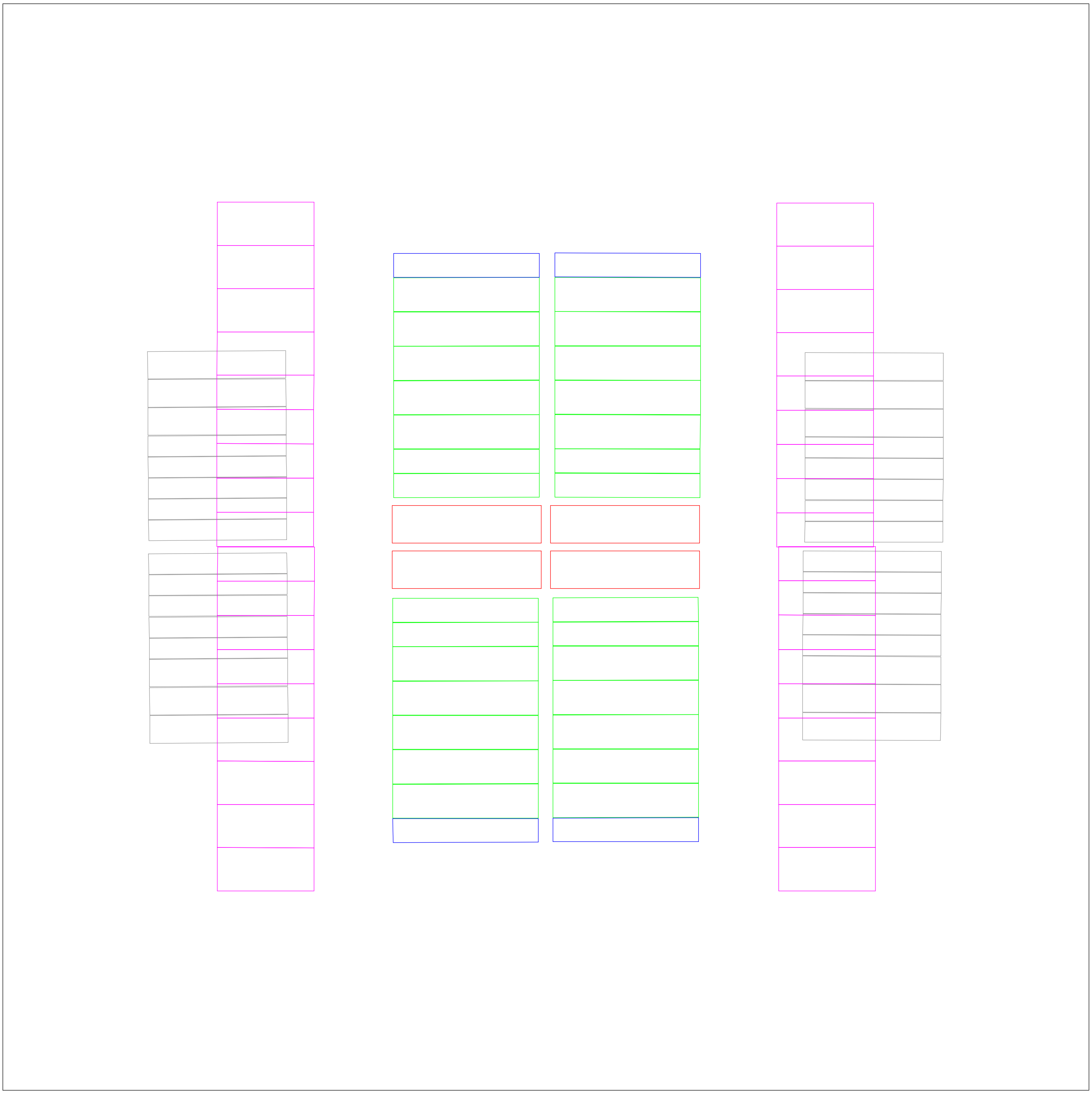

Figure 1: The Cosmic Bottom scintillation counters. Viewed in color, the CFB counters are green, the CFB Hole counters are red, the CFC counters are purple, and the EFB counters are greyscale. The new "Wing" counters are blue. The counters were artificially thickened in order to make the picture.

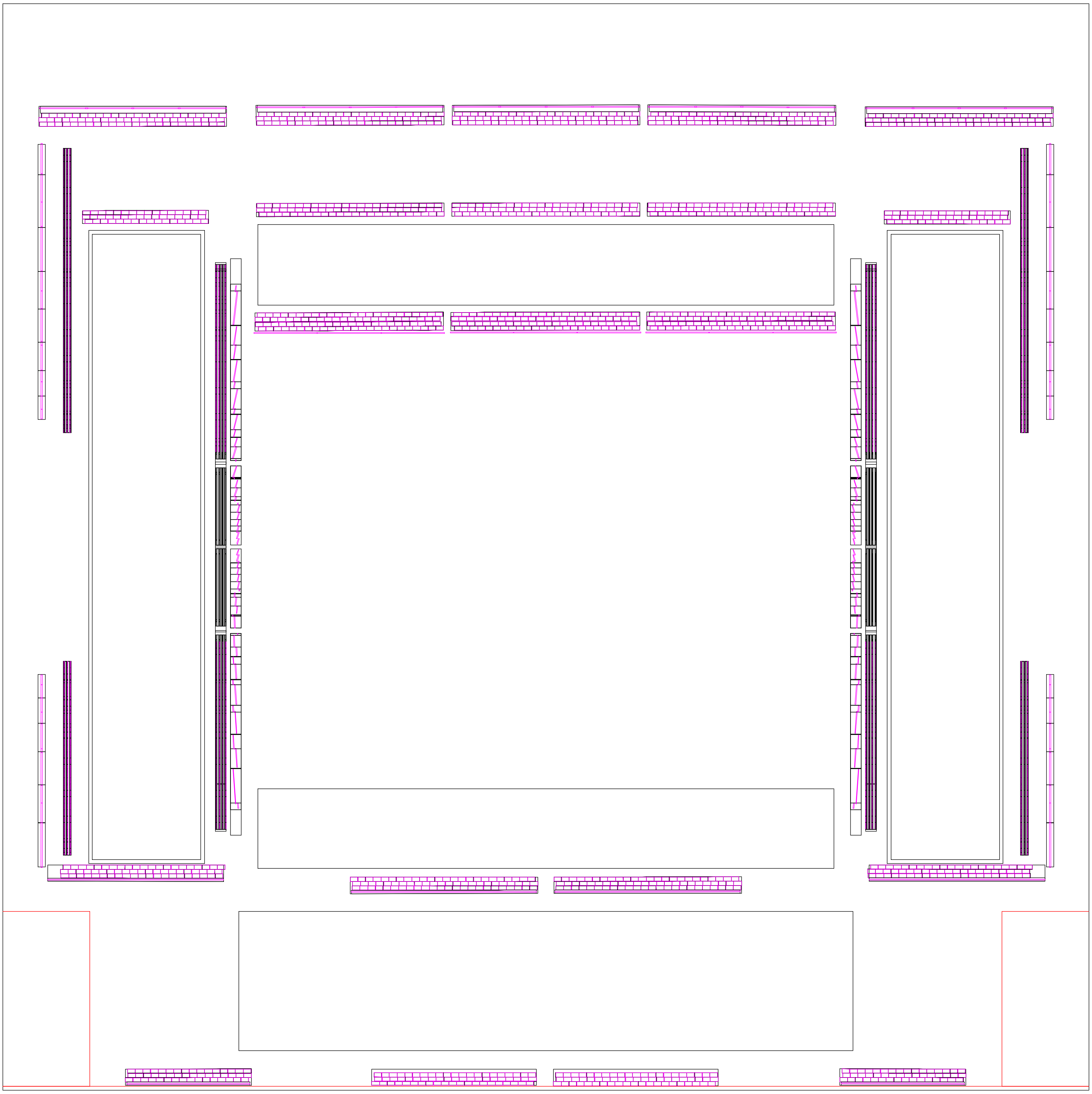

Figure 2: Side view of the DØdetector.