

SBND Progress – April 2017

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I. SBND PMT Mount Assembly

Figure 1 shows the latest design of the SBND Phototube (PMT) mount assembly for the Photon Detection System (PDS). Shown in the figure are the constant force springs (purple), the canted coil springs (yellow), and the 7-inch PMT base (green). Both sets of springs are on order.

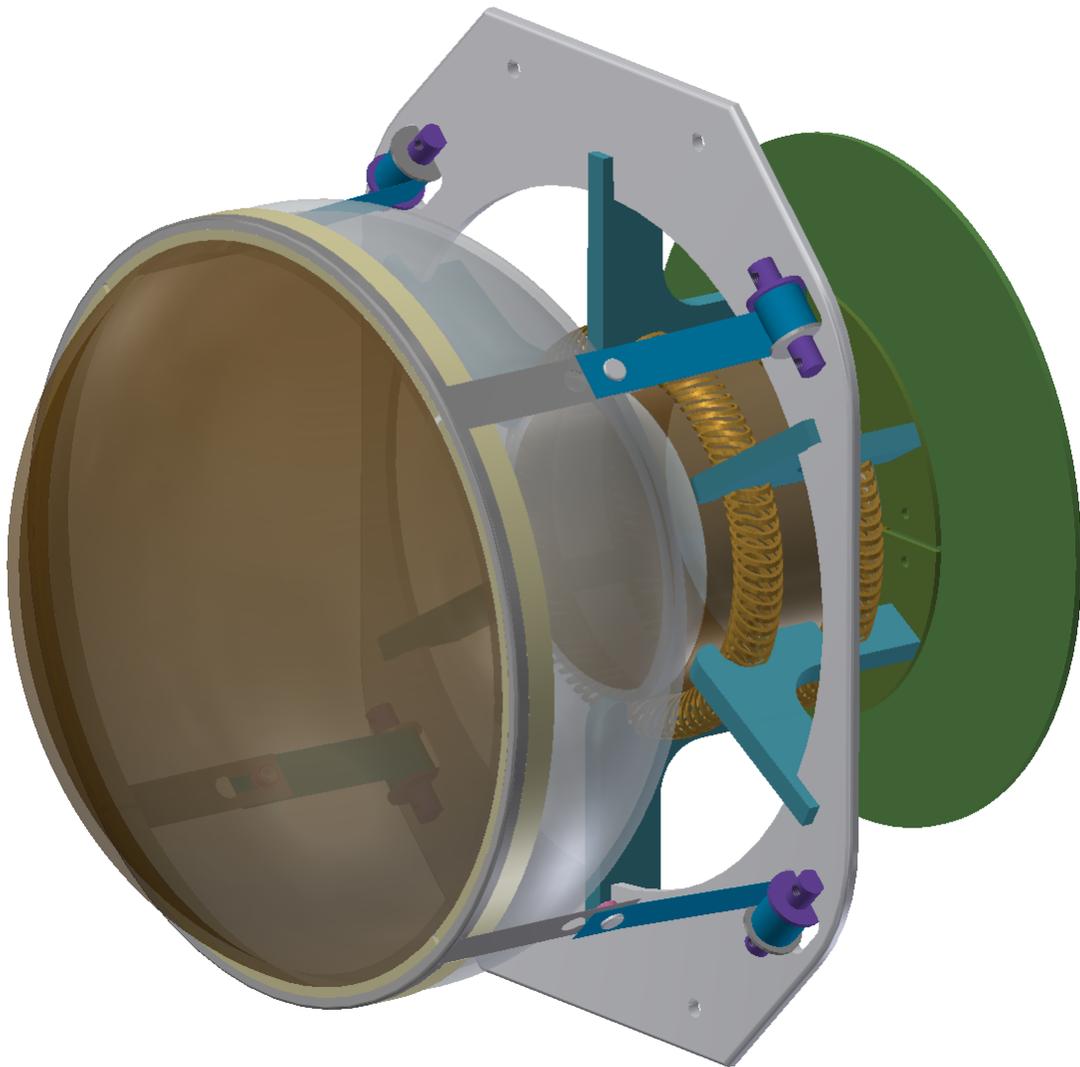


Figure 1: The latest design of the SBND PMT mount assembly.

II. SBND PMT Base Design

Figure 2 shows the final base design for the 10-stage 8-inch Hamamatsu phototubes that will be used in the SBND Photon Detection System (PDS). Preliminary orders for the bases have been placed.

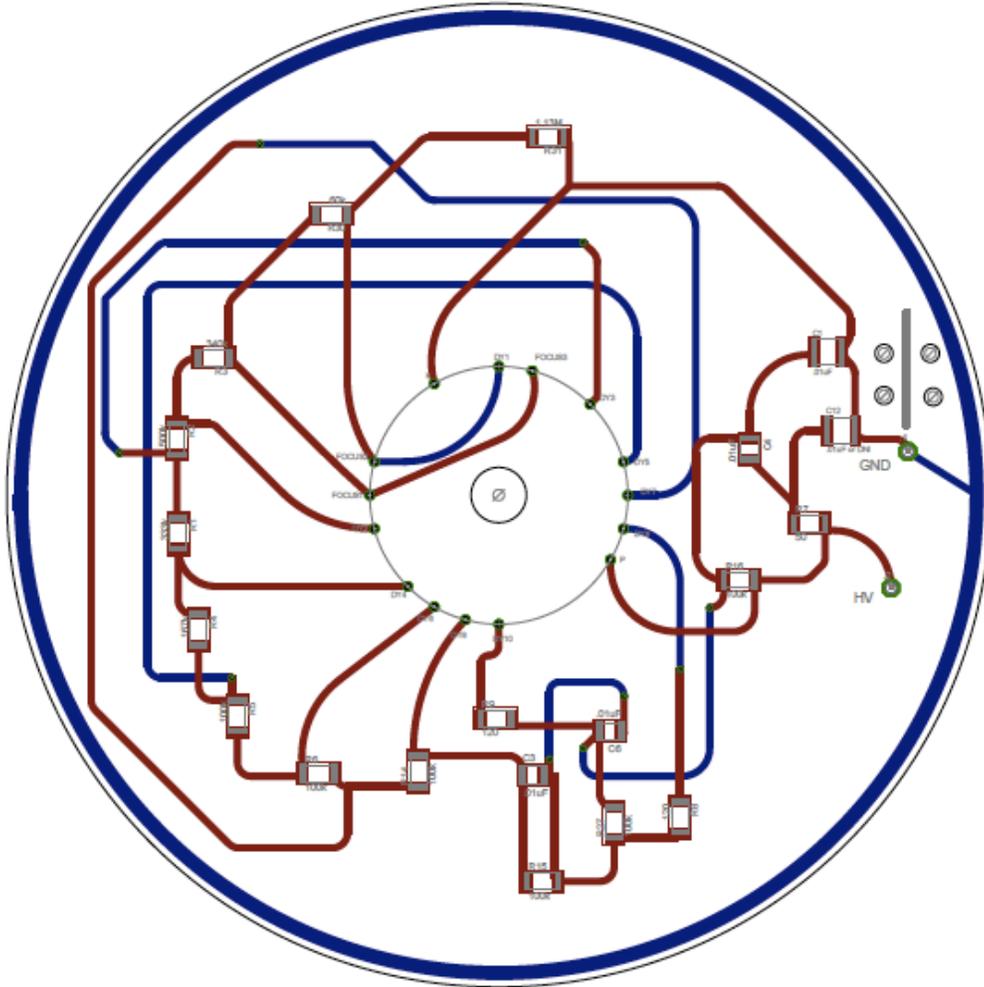


Figure 2: The final PMT base design for the 10-stage Hamamatsu 8-inch PMTs that will be used in the SBND PDS.

III. SBND Position Resolution Using the Photon Detection System (PDS)

A simple algorithm, based solely on PMT pulse heights in the PDS, can determine the x, y, and z positions of deposited energy in the SBND TPC with resolutions of ~ 24 cm, ~ 17 cm, and ~ 17 cm, respectively, where x is the drift direction, y is vertical, and z is along the beam direction. For the future, we will attempt to determine the direction of tracks in the TPC.

IV. MiniBooNE Beam-Dump Results

MiniBooNE took data in beam-dump mode in 2014 and collected 1.86 E20 POT. This enables MiniBooNE to set improved limits on light dark matter. A paper has appeared on the arXiv ([arXiv:1702.02688](https://arxiv.org/abs/1702.02688)) and has been submitted to PRL. Two other channels are now being analyzed.