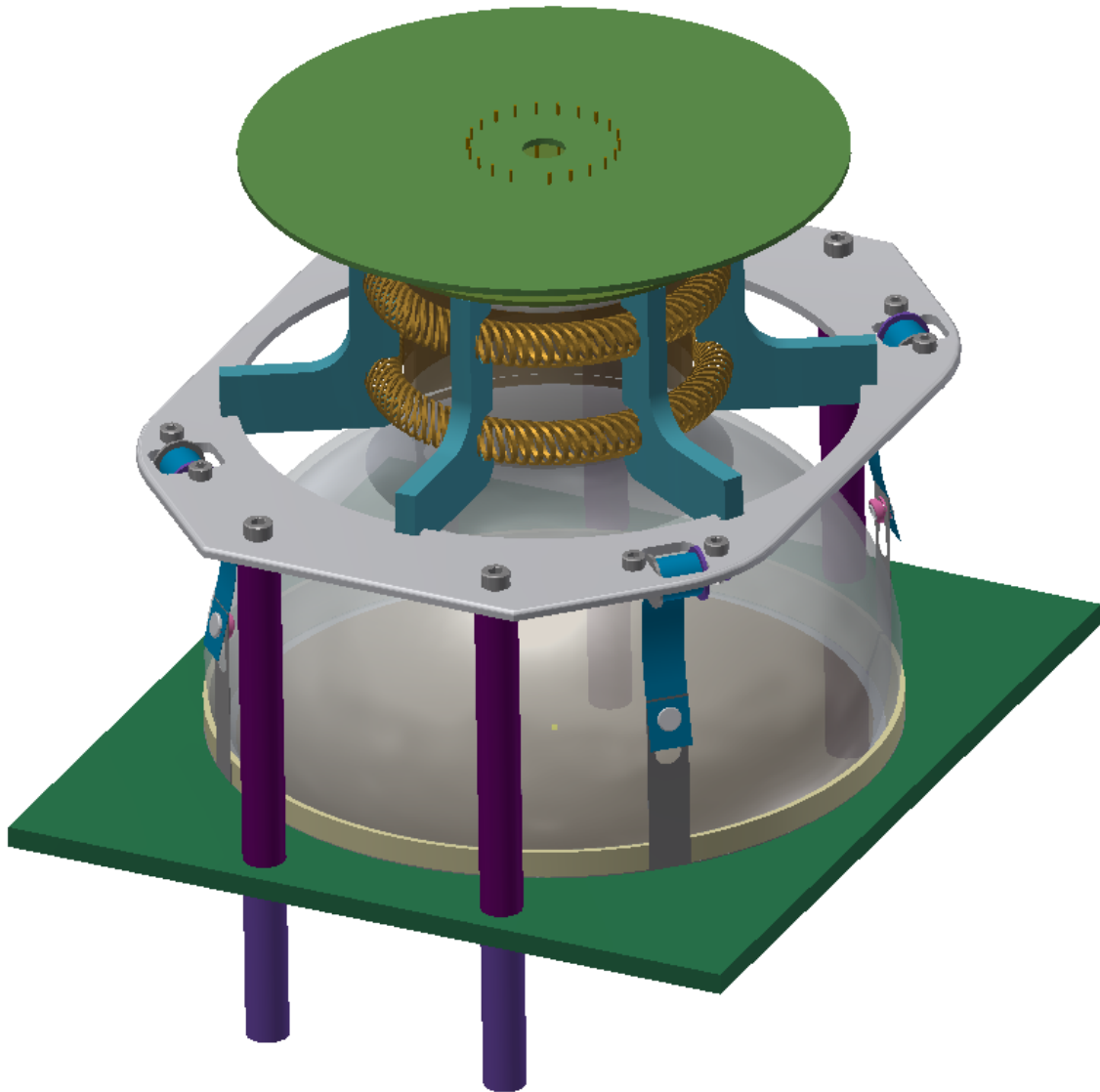


## SBND Progress – October 2017

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### I. SBND PDS PMT Mounting

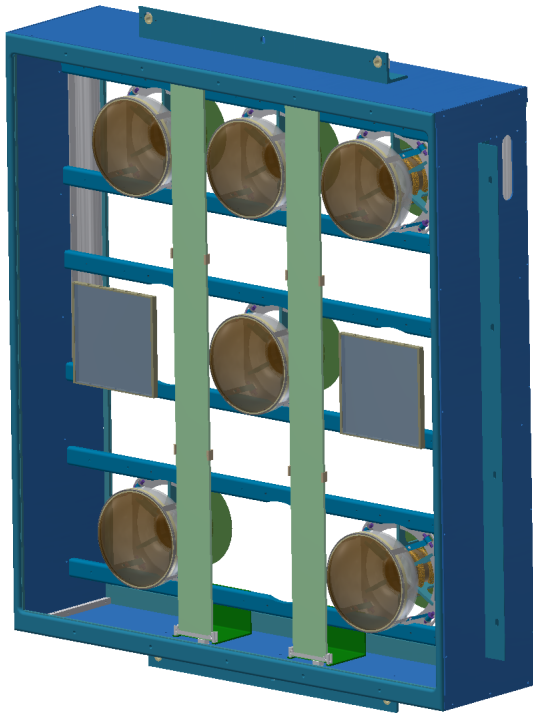
Figure 1 shows the latest design of the SBND Photon Detection System (PDS) phototube mounting system. The flange/spring subassembly will keep the phototubes securely positioned.



*Figure 1: The latest design of the SBND PDS phototube mounting system.*

### II. SBND PMT Coatings

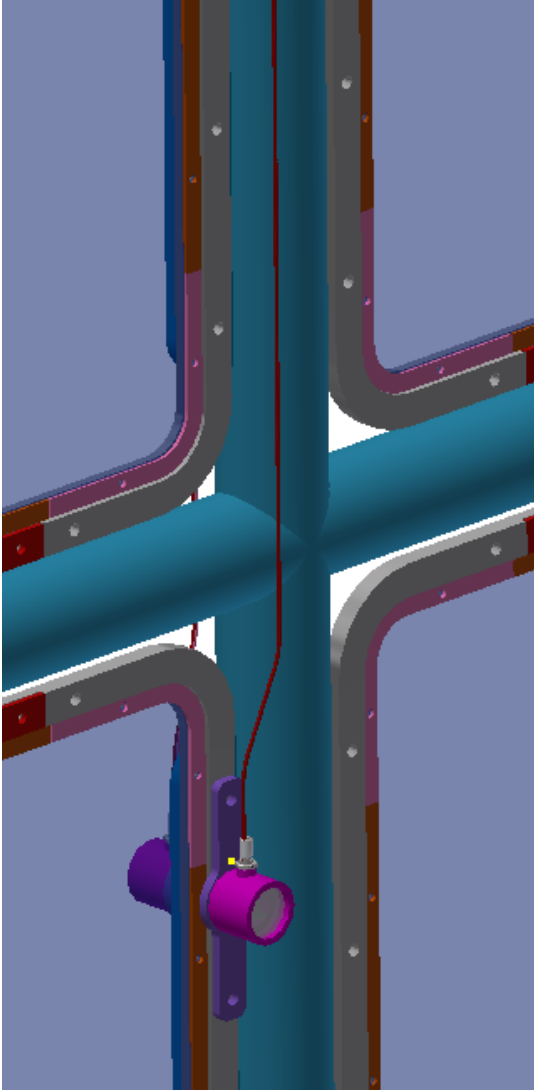
Additional Hamamatsu 8-inch PMTs have arrived, so that we now plan to have a total of 160 PMTs with 120 PMTs coated with TPB and 40 uncoated. The coated PMTs will be sensitive to both scintillation light and Cherenkov light, while the uncoated PMTs will be only sensitive to Cherenkov light. As shown in Figure 2, there will be a total of 24 modules (12 modules on each side) with 16 modules containing 7 PMTs (5 coated and 2 uncoated) and 8 modules containing 6 PMTs (5 coated and 1 uncoated). It is estimated that there will be approximately 0.7 Cherenkov photoelectrons/MeV of electron energy observed. At present, 80 PMTs have been sent to INTLVAC in Canada for TPB coating and 20 PMTs have been returned to LANL with coatings that appear of excellent quality. Cold testing of the coated PMTs will begin soon.



*Figure 2: A schematic drawing of a PDS module. The modules will hold either 6 or 7 PMTs (5 PMTs coated with TPB and 1 or 2 uncoated PMTs).*

### III. SBND PDS Calibration Diffusers

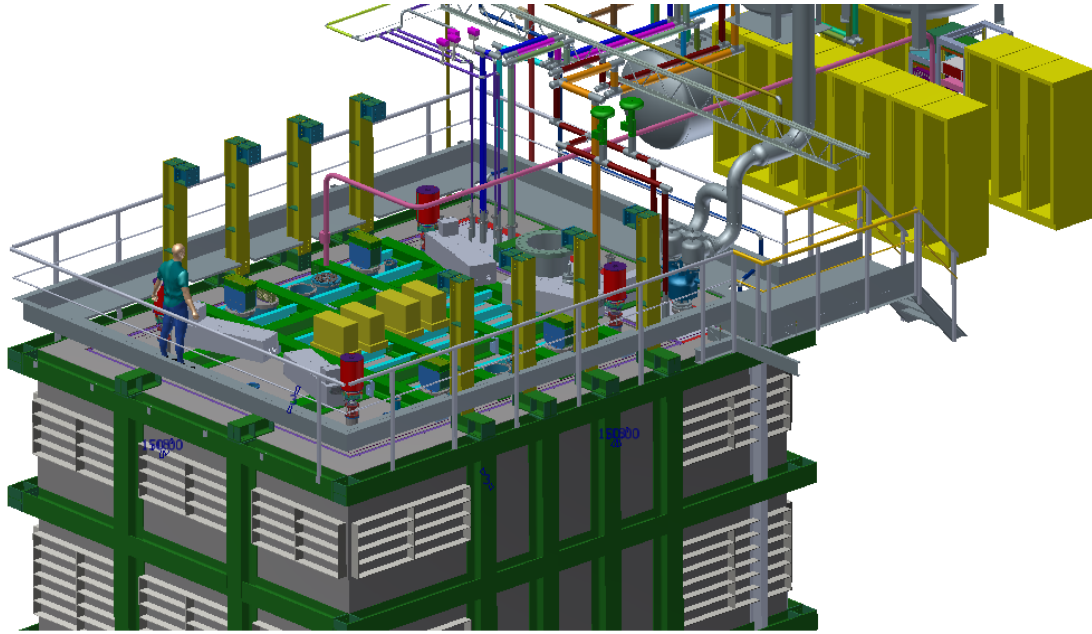
Figure 3 shows a schematic drawing of a PDS calibration diffuser. The current plan is to install 5 diffusers on each side of the cathode using existing holes. The diffusers are connected to the PMT feedthrough flange by 8m long fiber optic cables.



*Figure 3: A schematic drawing of a PDS calibration diffuser.*

#### IV. SBND PDS Electronic Racks

Figure 4 is a schematic drawing of the top of the SBND detector, showing the PDS cable bundle in pink and the location of the PDS electronics racks (yellow), which will reside on the mezzanine.



*Figure 4: A schematic drawing of the top of the SBND detector, showing the PDS cable bundle in pink and the location of the PDS electronics racks in yellow.*