

ProtoDUNE-SP

Survey Discussion

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- Jack, Bo and myself had a first meeting with survey people (Dirk Mergelkuhl and Konstantinos Nikolitsas) last January during the collaboration meeting
- Outcome of the meeting:
 - A laser survey inside the cryostat is extremely difficult to perform, being the membrane/false floor not stable enough for the laser system
 - Photogrammetry would work much better for us. Problems arise once the TPC is fully assembled: photogrammetry needs a wide view angle and there's simply not enough space to take pictures all around the TPC
 - More basic problem: we can easily survey a completed APA plane inside the cryostat, but once the field cages are attached to it, the plane will move and twist. Also, being the TPC hanging only from the top, it will shrink and move once cold, invalidating the survey done in warm if we can't determine its position once cold.
- ***What does really make sense to survey?***

What survey wants from us ASAP

- What (and when) we want to survey in the clean room and to which precision
- What (and when) we want to survey in the cryostat and to which precision
- What (and when) we want to survey after filling and to which precision
- **Fact #1:** the earlier we provide feedbacks to the survey group, the more chances we have to get what we want. We tell them what we'd like to survey and they'll seek the best solution for our case. But if we move late, they may not have resources or time to satisfy our requests
- **Fact #2:** they're expecting we tell them what to survey to which precision. That's all they want to know now

A list of survey requests I've heard of with some additional questions

- DSS support position (respect to south wall and beam plug) before beams installation
 - **To which precision?**
 - **Do we want the DSS to be surveyed after its installation?**
 - **Can we determine its position wrt DSS flanges outside the cryostat?**
 - **Do we survey APA, CPA, End Wall mount points?**

- Beam Plug position wrt beam window
 - **To which precision?**

- From a physics analysis point of view, all we want to know is in which position along the drift direction the beam enters the TPC volume. With a ~cm level precision. **Once the TPC is cold**
 - **Do we have a way to deduce this information from a “warm” survey?**

- **Do we want to survey APA1 planarity in the Clean Room once hanging vertical?**

- **Do we want to survey CPA planarity in the Clean Room once hanging vertical?**

- **What else should we ask to have surveyed?**