Resolved ProtoDUNE-II Integration Issues:

* How to support end-walls from DSS (ProtoDUNE-I or DUNE-like)? Adopted DUNE-like suspension from DSS beams 2 and 4.
* Whether to use DUNE or ProtoDUNE-I feedthroughs (cross versus tee) and assignment of necessary cryostat penetrations. Adopted DUNE-style cross feedthroughs targeting penetrations 2.2 and 2.6.
* Confirm positioning of APAs. Confirmed. Upside-down APAs on Saleve side. APAs oriented with low slot side tube nearest the TCO (as planned for DUNE).
* Finalize design of cold electronics support hardware for upside-down APA. Manhong passed updated design to Kyle which has been incorporated into global model.
* Assignment of potential laser penetrations. Targeting penetrations 2.5 and 2.7.
* Design of “special” top field cage module to accommodate overhead TPC penetration. Straight-forward based on current location of penetration 2.7.
* Finalize upside-down APA cable routing based on final design of CE support hardware. Manhong has finalized plan for routing of cables on upside-down APAs.
* How to accommodate shrinkage of stainless-steel runway beams (upper-layer DSS support beams) positioned transverse to the incoming beam direction?
  + Shrinkage potentially defines final TPC drift distances. Initial drift distances warm to be set such that correct drift distance obtained after cooling.
  + CT mismatch between SS beams and FRP frames of top field cage modules implies a different situation than for DUNE Far Detector where final TPC drift distances are obtained through the equivalent shrinkage of top ground plane support beams and the frames of top field cage modules (both FRP). To account for differences in the shrinkage of steel and FRP components, plan to use spherical washers at support rod connections to both APA and DSS beam such that APA is allowed to hang vertically in the warm.
  + Is a different mechanism for attaching the top field cage modules to the APAs necessary? Field cage connections are designed to not rely on friction-based movement during the cooling process.
* For ProtoDUNE-I, the APA mount had a spherical joint in the connection to the beam, which allowed for the connection between the beam and the APA to pivot in order to accommodate the different CTE in the DSS and the TPC. Do we need a similar pivoting joint in ProtoDUNE-II to ensure that the M20 support between the beam and the APA do not see too much of a bending load? Agreed that this is required (rational described above). Design has been modified accordingly.
* Validate finalized design for suspension of upside-down APAs
  + PSL engineering analysis and Ash River prototyping activities. Analysis in progress to support Ash River activities starting in June.
  + Confirm that the design is compatible with testing APAs in the Cold Box and installing them in the cryostat. Design has been modified resulting in 7mm clearance.

* + Confirm that the yoke for the upside-down APAs do not need to accommodate the ProtoDUNE-I style dual trolleys (currently designed to be hung from single DUNE-style trolley only). Confirmed.

Discussed ProtoDUNE-II Integration Issues still under study:

* How to support top ground plane from DSS? Conceptual designs presented by Dimitar. Working to finalize.
* How to support bottom ground plane from cryostat floor? Conceptual design presented by Dimitar. Working to finalize.
* How to design and support beam-plug? Conceptual designs presented by Dimitar. Working to finalize.
* Whether to install a single invar beam as part of DSS for test purposes. Agreed that this was good idea but no further discussion.
* Finalize cable routing at top of cryostat based on feedthrough decision. In progress based on final decision regarding penetrations. Need to add feature into APA design that will provide cable slack for lowering up-side down APA into its final position.
* Is the new APA trolley ok for use inside the cold box (was an issue with the original APA trolley for ProtoDUNE-I)? Initial discussion regarding approach for obtaining required safety approvals. Requirements need to be fully specified.

ProtoDUNE-II Integration Issues still to be Addressed:

* Locations and mounting schemes for temperature sensors and how cables get routed through penetrations.
* Finalize plan for purity monitors.
* Define fiber cable routes and penetrations for PD calibration hardware mounted on CPA modules.
* Initiate laser safety discussion with CERN ES&H team.
* Define installation sequence
  + Do we need to perform the final TPC deployment after TCO closure or will the TCO be able to be closed from the outside?
  + Are there installation interferences with the end-wall field cages?