PAUL SCHERRER INSTITUT

HPAD Mechanics

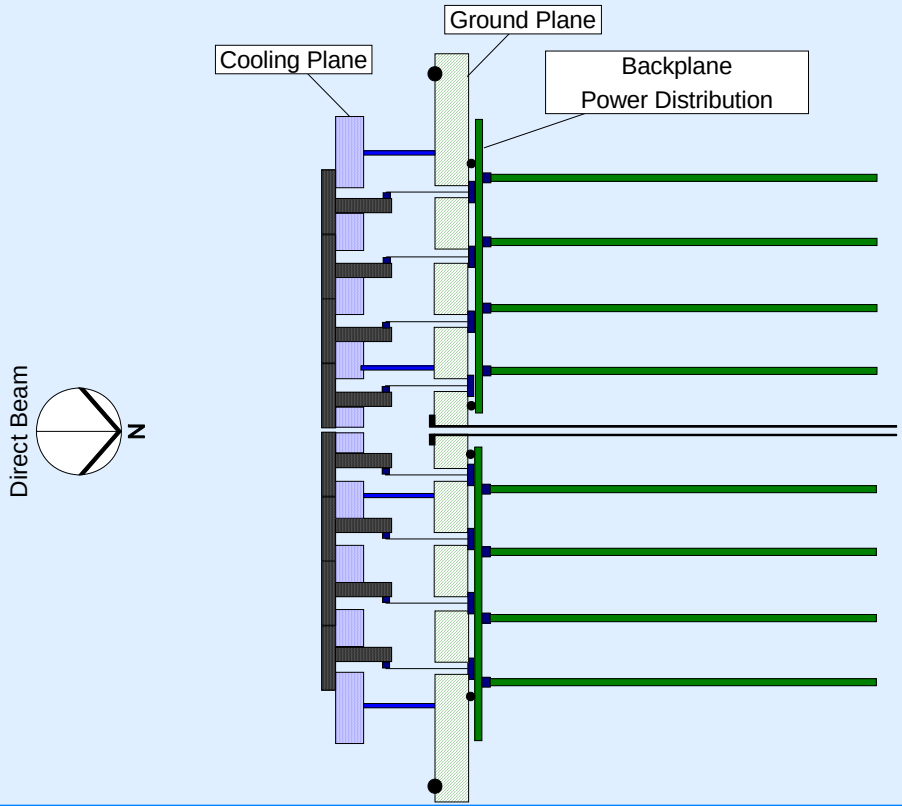
08.10.2008

Requirements

- Vaccum tightness up to about 10^{-4} to 10^{-5} bar – connectable to flight tube
- Also usable for normal pressure environments
- Cooling possibility down to -15°C on the sensor side
- Backend Electronics easy accessible and interchangeable
- Easy mountable and exchangeable modules
- Extendable for multi-Detector geometries
- No Detector in the beamline
- Scalability
- Direct Beam lead-through

Result of the mechanics meeting: Two plane Support

- „Double plane Design“ (One plane for cooling and module support, fully in the vacuum. Another plane (PCB!) as vacuum barrier, power distribution (1kA!)



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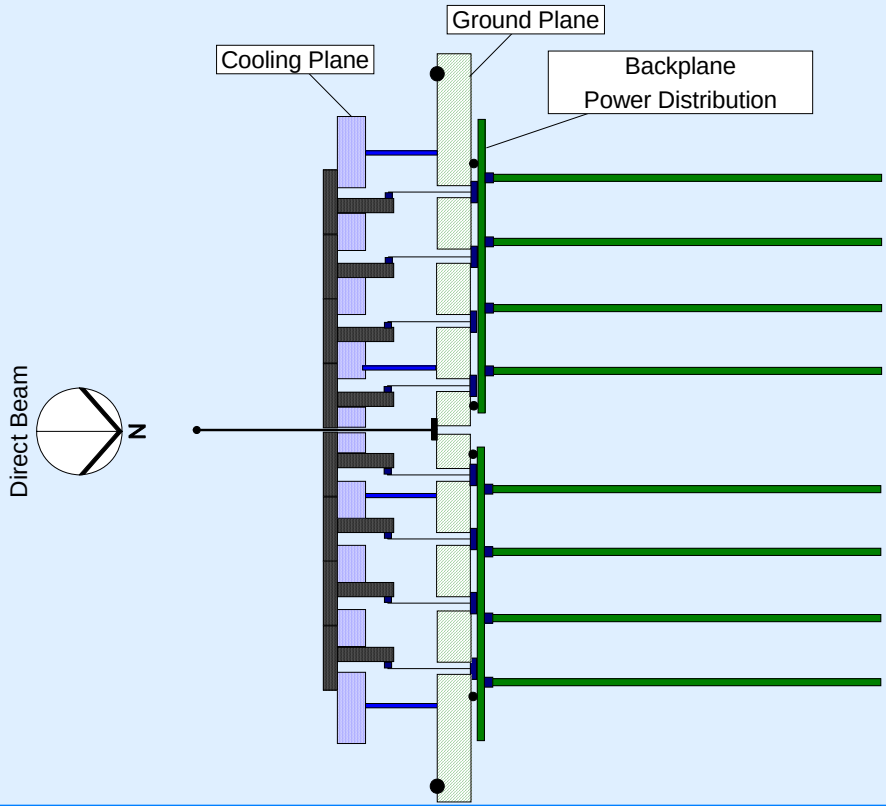

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Advantages

- Mechanical decoupling of the cooled part from the ambient temperature parts
- If used without vacuum -> small nitrogen (even better He) cask -> No condensation problems
- Backend electronics can run under ambient temperature. Less cooling problems.
- Power backplane can distribute and handle the high power
- Easy vacuum barrier. PCB of the Power backplane
- Servicing or exchange of defect backend electronics gets very easy
- We can use different connectors for HV, High PWR, LVDS
- No need to feed the module through the backplane (likely less damage to wire-bonds)
- Easy setup for future Detector enhancements in size
- Easy realisation of the center hole
- Grid will still remain for all four Detector Areas (some are turned for an angle of pi)

Module and Assembly realization

- „Drawer Design” for the Modules