Wrap-up Power Session

Purpose of the wrap-up

- Based on the presented material, identify possible common developments
- Keeping in mind:
  - Some of the power supplies will come from industry
  - A good fraction requires radiation hardness and B field tolerance
  - Development and qualification take time
  - Maintenance to be taken into account and easier if limited number of device types

Point of Load DC-DC

- Most of the detectors plan to use this architecture
  - Except pixels
- Assume we'll get a radiation hard enough version (Air core inductance for B)
- Might require some adaptations for some applications
  - CMS tracker
  - Physical size (mainly the coil)
- COTS may be considered for outer layers (e.g. calorimeters and muons)
  - Could allow higher input voltage
  - A lot of testing required for validation…
  - If one found OK, it should be advertised

Serial power

- Only considered for pixel
- Development(s) going on in a coordinated way (under RD53 umbrella)
- No more to say?

Outer Trackers

- POLs to be used on the front-end
- Possibility to power directly from the service cavern (~15V source)
  - No need for radiation tolerant bulk supplies
  - Intelligent PP
  - Voltage drops in the cables, dynamics and cable sizes to be studied
  - Is there space in the service cavern and in the cable channels?
- Common design ATLAS-CMS possible
  - If ATLAS can replace most cables

Calorimeters (1)

- POLs to be used on the front-end
- A CMS super-module or an ATLAS tile drawer or LAr readout crate requires a substantial amount of power in a limited place
  - E.g. ~4 kW for an ATLAS Lar crate
- Direct powering from the service caverns might be difficult
  - Large current needed at 12 V
  - Higher voltage could be used but not with FEAST as POL

Calorimeters (2)

- CMS HGC. Too early…
- CMS ECAL plan to use the same kind of architecture as today
  - MARATON in the cavern and replacement of current linear voltage regulators by POLs
- ATLAS Lar and Tiles
  - POLs on the front-end board
  - Another level of DC-DC close to the FE crates/Drawers
  - Similar to CMS ECAL but requires special DC-DC
- Is there a possibility to steamline the developments?

Muons

- POL DC-DC to be used in a number of case
- Existing services constraint a lot the upgrade path
  - New system to stick to the existing granularity/geometry
- Can we envisage dramatic change ?
  - E.g. moving the power supplies in the service caverns and replacing existing PS by clever PP?

Discussion

- Is there scope for: ?
  - Common developments
    - Establish Requirements
    - Build Demonstrators with industrial partners
    - Run System Tests
    - Run Qualification Tests
  - Common procurement
  - Common maintenance and logistics
- Differentiate between:
  - Tracker-type and Calo-type systems ?
  - Muons ?
- Serial Powering ?