
SSD offline status

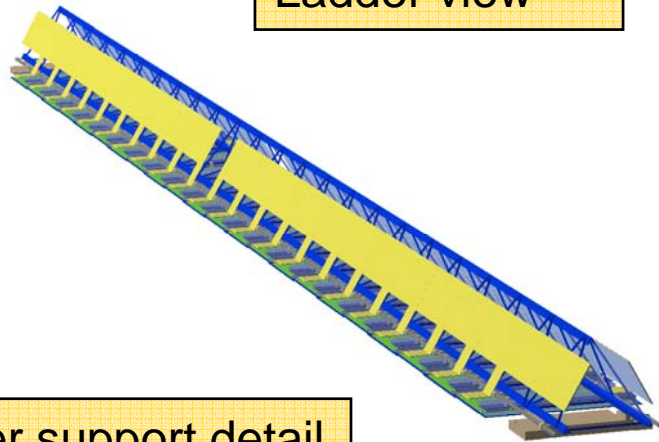
Enrico Fragiacomò
Offline week, 8-10-2007

Project task report

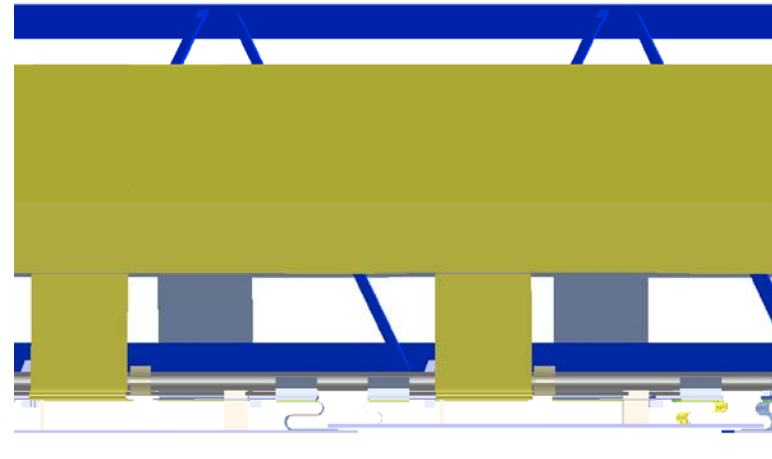
Geometry >> Geometry as installed	done
Raw Data Format >> Provide DDL to equipment ID mapping	done
Raw Data Format >> Provide Geometrical Mapping	done
Raw Data Format >> Reconstruction from raw data	new (EF)
Alignment >> Format of Survey data and conversion into align. objects	Tbd (GN)
Event display >> Raw data display	Tbd (?)
Calibration >> SHUTTLE >> preprocessor algorithm implemented	done
Calibration >> User Requirements	Almost ready
Calbration >> decalibration strategy	Tbd (EF)
Calibration >> Offline >> Provide data quality control macro	Tbd (EF)
Quality Assurance	Tbd (EF)

Geometry

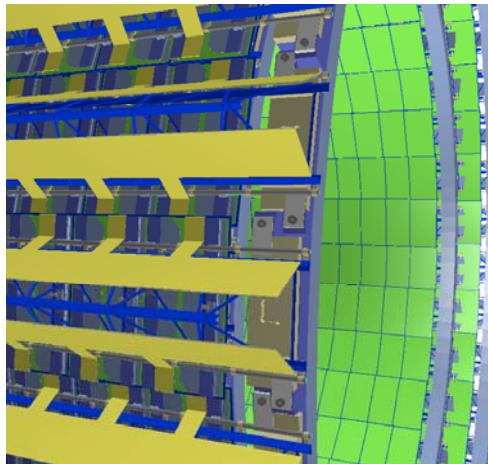
Ladder view



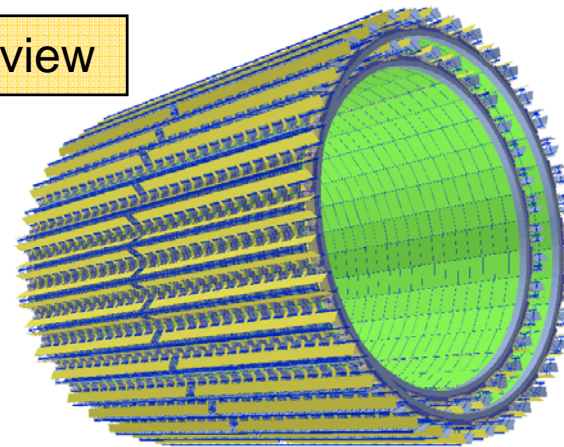
Ladder side detail



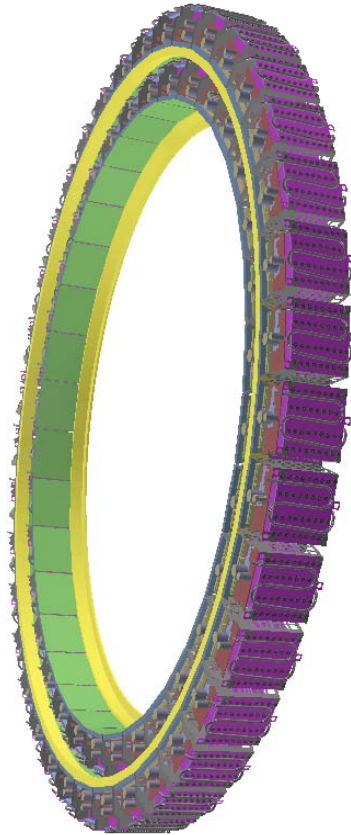
Ladder support detail



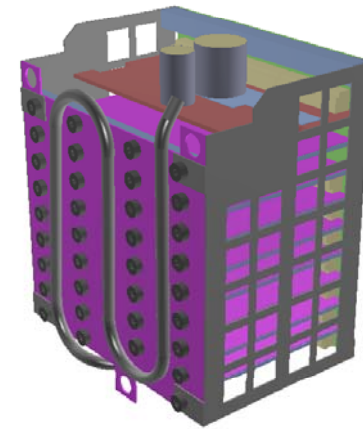
Layers view



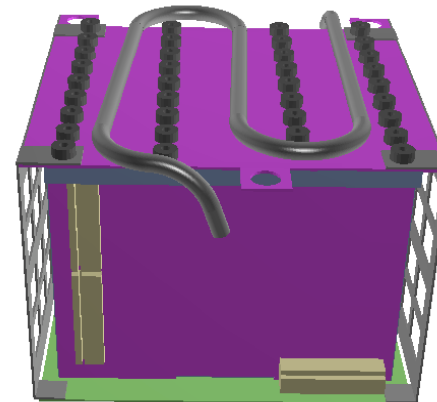
Geometry



Endcaps and endcaps support



Endcap details



Raw Data -> DDL map

- Coded in AliTStreamSSD (with the correct 32-bit decoding for rawdata)
- Revised on the basis of the latest HW map
- For each DDL associates AD/ADC to module index (500-2198)
- Both AliTDDLRawdata (in encoding) and AliTStreamSSD (in decoding) make use of the DDL map

Raw Data -> Reconstruction

- Reconstruction from simulated data works successfully!
- **Reconstruction from real rawdata fails!**
- Present version of the V2 cluster finder for rawdata expects data sorted wrt modules (i.e. a pattern like mod1/strip1, mod1/strip2...mod2/strip1, mod2/strip2,...)
- The pattern of rawdata from the electronics is instead mod1/strip1, mod2/strip1, ... mod1/strip2, mod2/strip2 ...
- The largest level where rawdata are mixed up is the AD module (which reads 12 modules)
- Several solutions found:
 1. Sorting rawdata in LDCs
 2. raw2digit conversion (but would involve the whole ITS)
 3. **buffering rawdata for each AD (12x1536x32 bits) and select strips according to ADC index**
- **Work in progress (highest priority!)**

Calibration parameters: source and use

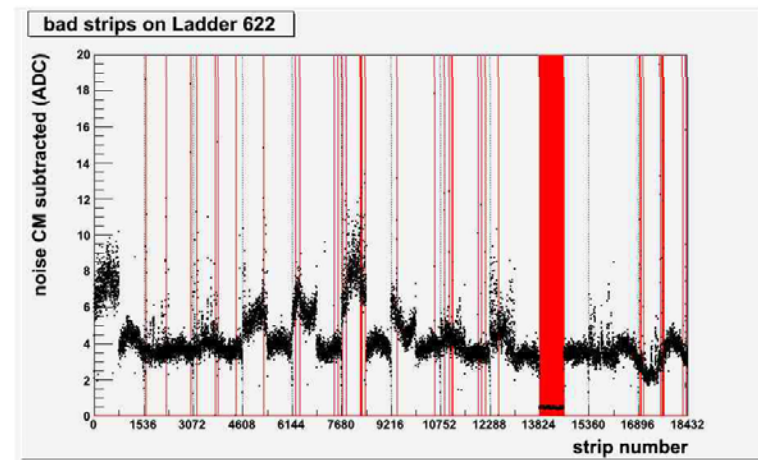
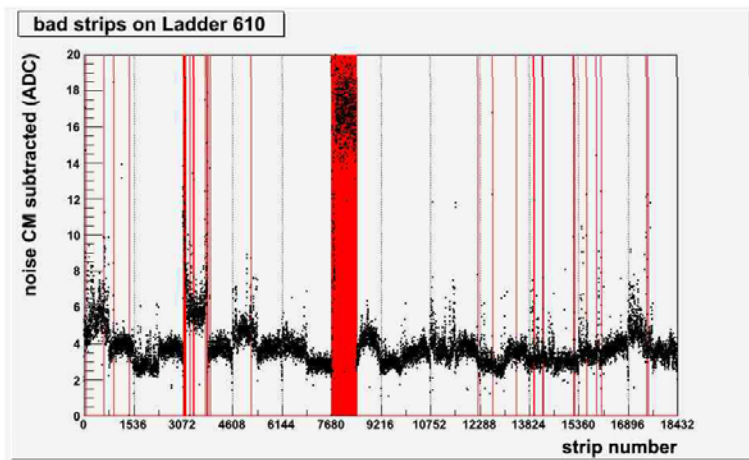
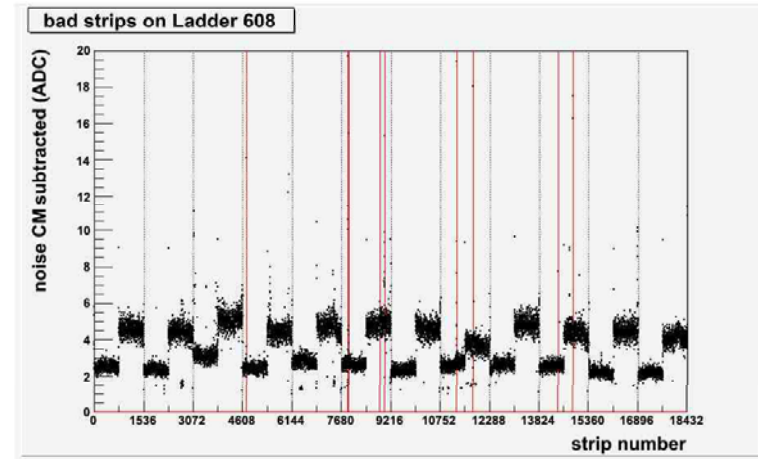
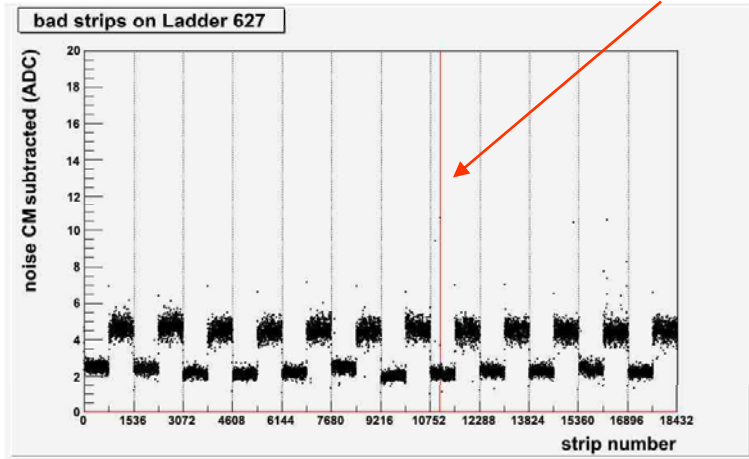
Pedestal run	<ul style="list-style-type: none">■ Noise■ Pedestal■ Common mode■ Bad Channels	<ul style="list-style-type: none">Noise in OCDBBad channel map in OCDBPedestal and common mode as ref. data
Special run?	<ul style="list-style-type: none">■ Gain	<ul style="list-style-type: none">Gain in OCDB
DCS	<ul style="list-style-type: none">■ Temperature■ Currents	<ul style="list-style-type: none">In OCDB as ref. data

Calibration strategy

- Improve algorithm ability to correctly calculate pedestal/noise (e.g. comparing from one run to the other)
- Keep pedestal, common mode, temperature and current as reference data for later checks
- ... but have a good monitoring system which notify strange behaviors during calibration and take actions (e.g. rerun calibration)

Noise and bad channels (from tests)

Bad or Dead



Calibration -> Noise

- Detector Algorithm (ITSSSDPEDda.cxx) for pedestal/noise calculation committed to cvs
- Purpose: provides noise level, uploads pedestal/noise to the electronics (to be tested)
 - Three new AliRoot classes support the DA: AliITSTChannelDaSSD, AliITSHandleDaSSD, AliITSMModuleDaSSD
 - Three new classes (AliITSTNoiseSSD, AliITSTGainSSD and AliITSTBadChannelsSSD) support storing of the calibration parameters in the OCDB.
- Simulated effect of noise and dead channels in the reconstruction (talk schedule for rec session tomorrow)

Calibration: what remains to be done

- From noise to dead/noisy channel map
(wait for filtering criteria from test data)
 - optimization of algorithms for noise calculation (e.g. is the noise gaussian?)
Work is in progress (results from tests)

Calibration -> preprocessor

- Preprocessor for noise committed at the end of August
- DA writes TObjArray of AliITSNoiseSSD objects
- Straightforward for the Preprocessor, reads AliITSNoiseSSD from the file and saves them directly to the ODCB

Calibration: gain

- Gain calibration. Two solutions under study
 - Charge distribution in one-strip 1Dclusters (could be done from rawdata on LDCs);
 - Signal from digit correlated to tracks (has to be done offline after rec + access to digits)