SDHCAL Raw data

Gérald Grenier

IPN Lyon/Université Lyon 1

December 19, 2018

Data

LCEvent

The raw data slcio files contain one readout per LCEvent. The LCEvent has 2 collections

- RuXDAQ collection of LCGenericObject : contains the DAQ buffer as is
- DHCALRawHits collection of RawCalorimeterHit : Same info as in RuXDAQ collection

The LCEvent has a time stamp somehow related to the record time.

DHCALRawHits collection

collection parameters

The collection has parameters in the form DIF<number>_Triggers where <number> is the DIF number. These parameters have 8 integers :

- value [0] is the DTC (DIF Trigger Counter)
- value [1] is the GTC (Global Trigger Counter)
- value [2] is the BCID (at DIF level)
- value [3] are the 32 lower bits of the absolute BCID
- value [4] are the 32 upper bits of the absolute BCID
- value 5 to 7 are used for temperature sensor data if I remember correctly.

All these time values are taken at readout time.

DHCALRawHits object

Each raw hit object has the following data

- getCellID0() : (32 bits) contains DIF, ASIC, channel numbers in the following form : MSB : 2 bytes for the channel number, 1 byte for the ASIC number, 1 byte for the DIF number : LSB. The translation of this info to a coordinate needs some DIF map.
- getAmplitude() : the 2 last bits are the threshold crossed (value=1 for first threshold, 2 for third threshold and 3 for second threshold). Higher bits might be filled but I don't remember why.
- getTimeStamp() : the time counter of this hit before the readout.

Be carefull, DIF time counter (BCID, ...) are fast forward (higher value means later) while RawCalorimeterHit timestamp are backward (higher value means earlier).
The time of the hit since the last DIF power on is (TO BE CROSS-CHECKED) AboluteBCID - timestamp.