Status of TOF Software

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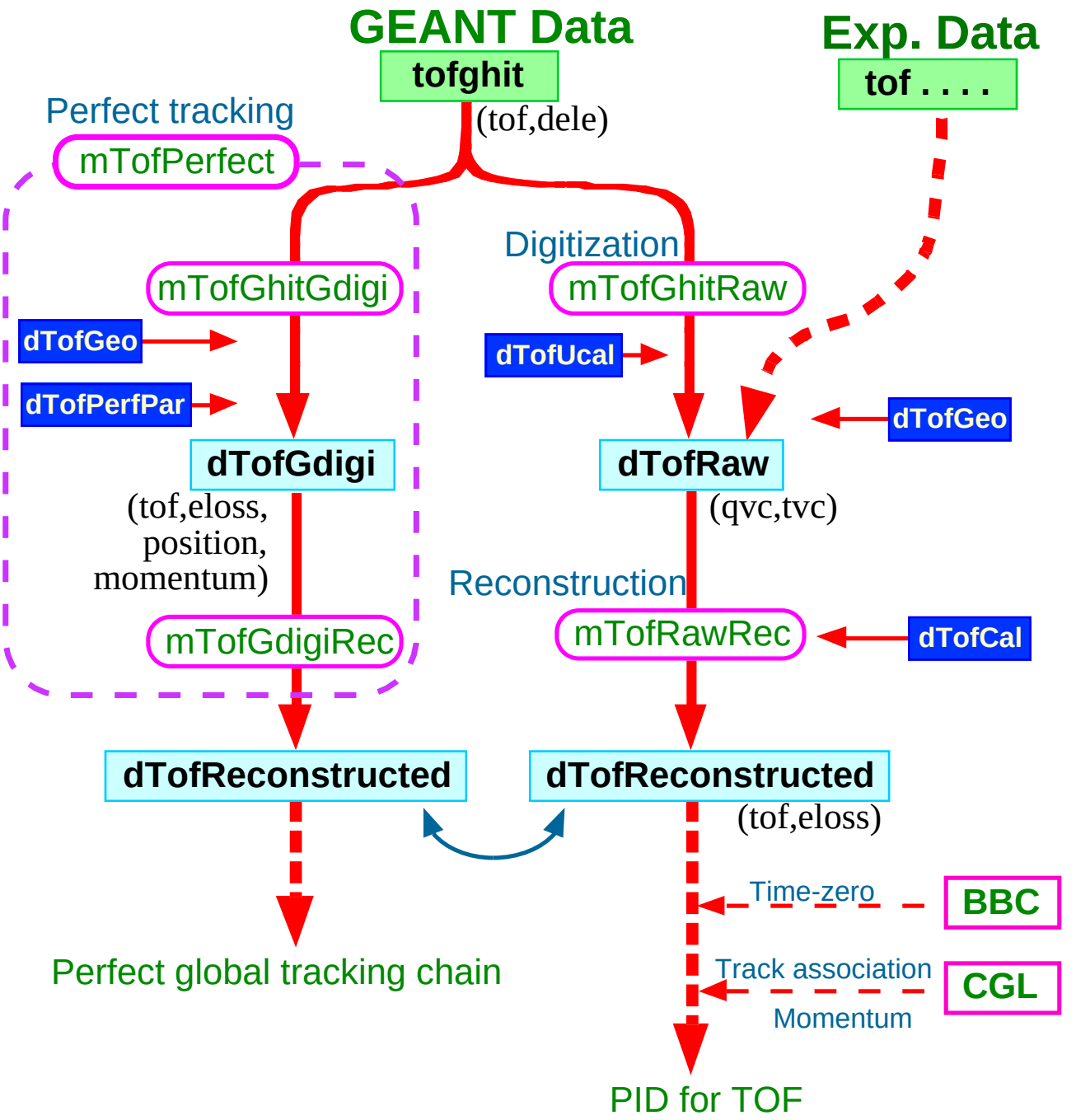
- Data flow of STAF-TOF code
- Recent status
- Calibration software
- Plan before MDC1

Data flow of STAF-TOF code



We can compare the two flows
to evaluate the TOF performance.

Table of STAF-TOF

dTofGdigi

Its data structure is same as PISORP output

convert from step by step information (tofghit) to track information

made for each tracks

dTofRaw

Raw data structure of TOF

made for each scintillator slats (2 PMT)

dTofReconstructed

End-product data structure for TOF

dTofRaw

```
/* Raw data structure */
struct dTofRaw {
  short  id;        /* reference key */
  short  slatid;    /* Slat ID (0-1055)*/
  short  sector;    /* Sector(0-1) */
  short  side;      /* South=0, North=1 */
  short  panel;     /* Panel (0-3) */
  short  slat;      /* Slat (0-95) */

  short  cell[2];  /*AMU cell ID (1-64)
                     [0]=Upper PMT, [1]=Lower PMT*/
  short  qvc[2];  /* QVC value in channel (1-4096) */
  short  tvc[2];   /* TVC value in channel (1-4096) */
};
```

dTofReconstructed

```
/* End-product data structure */
struct dTofReconstructed {
  short  id;        /* reference key */
  short  slatid;    /* Slat ID (0-1055)*/
  short  sector;    /* Sector(0-1) */
  short  side;      /* South=0, North=1 */
  short  panel;     /* Panel (0-3) */
  short  slat;      /* Slat (0-95) */

  float  tof;        /* Time-of-flight */
  float  eloss;      /* Energy loss */
  float  xtof[3];   /* TOF hit position */
  float  xtrk[3];   /* Projected track position */
};
```

Status of TOF chain

Perfect tracking (mTofPerfect)

It make the GEANT correct data for each tracks

already put in the Luxor perfect global tracking chain

Reconstruction (mTofGhitRaw --> mTofRawRec)

It make the digitized and reconstructed data for each slat

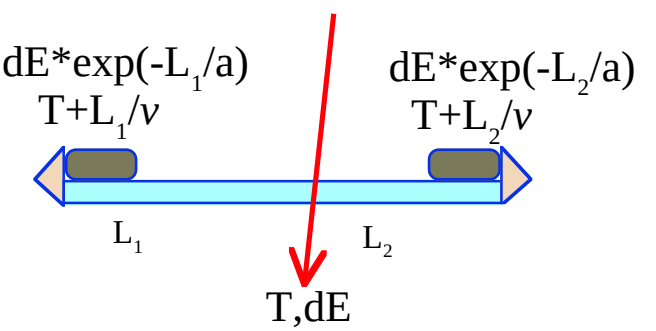
One data in scintillator slat separate two PMT.

Already included

- Energy loss [qvc value]
- Flight times [tvc value]
- PMT gain (but same value for all)
- Light attenuation and transit time to PMT in scintillator
  - In case of double hit, the tvc is recorded only the faster hit info.

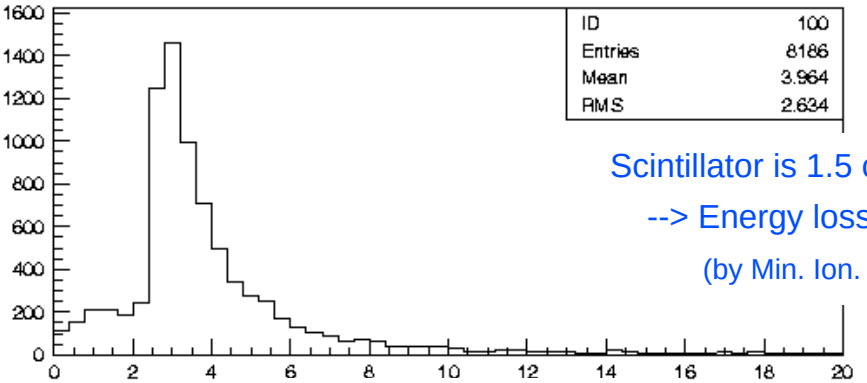
Not yet done

- Time resolution
- Slewing effect



figure

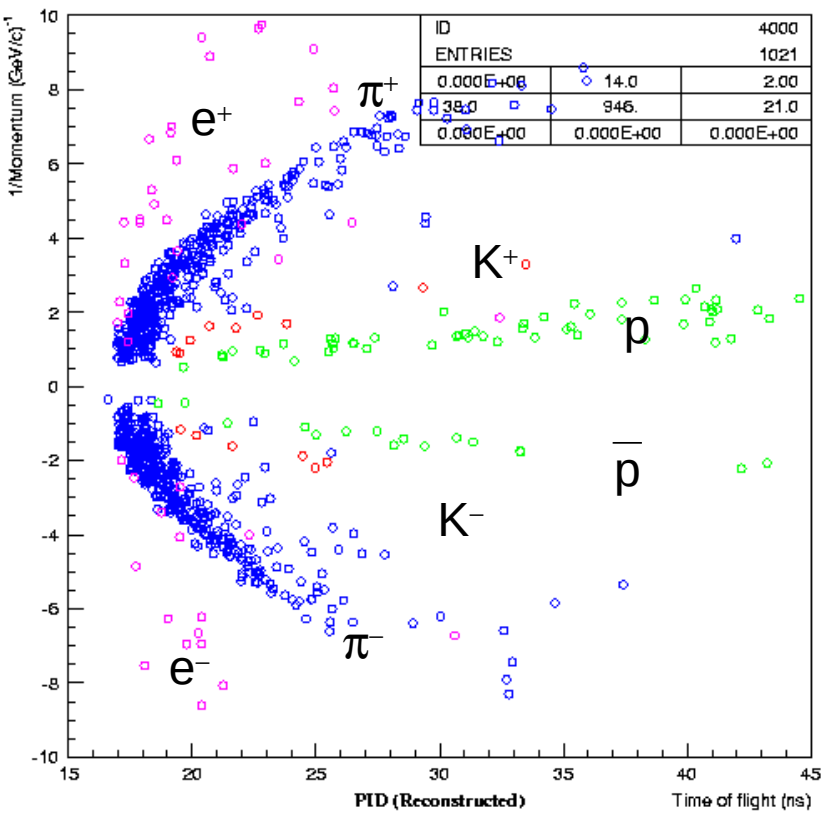
some rough plots



Scintillator is 1.5 cm thick
--> Energy loss ~3MeV
(by Min. Ion. particle)

Energy loss (MeV)

1/p (GeV^{-1})



TOF (ns)

momentum in GEANT data is used

Calibration software

Data structure for calibration constants has been defined. [dTofCal]

Now, we use the same calibration parameter in digitization.

We will develop the calibration module.

Who are working

Akio Kiyomichi, Hiroyuki Sako

When

in a few month

Plan before MDC1

Include in TOF chain

- Time resolution
- Slewing effect

Include after dTofReconstructed

- Time-zero from BBC
- Track association with CGL track
- Reconstructed momentum from CGL

==> Particle identification for TOF