Raw Vertex Hits in `LCIO`:
A Proposal

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thanks to Frank Gaede

LCIO
http://lcio.desy.de/

◇ LCIO is a persistency framework that defines data model for ILC detector studies.

◇ Intended to be used in both simulation studies and analysis frameworks.

◇ light weight and portability makes it suitable for use in detector R&D applications.

◇ provides C++ and Java implementation with a common interface (API) and Fortran interface to the C++ implementation.

◇ release 1.5 adds new classes for raw tracker data:
   TrackerRawData, TrackerData and TrackerPulse.

VtxRawHits in LCIO ?

◇ Useful to consider a generic `VtxRawHits` class to persist pixel data from detectors in lab and beam test in a format compatible between different groups and with GEANT 4 simulated events;

◇ this would offer the possibility to exchange test data, share clustering and data reduction algorithms and to compare/tune simulated data;

◇ efficient way to feed lab and test results into realistic full detector simulation and digitisation and study effects of backgrounds and local track density in pattern recognition and tracking;

◇ Test implementation of raw hits for Mimosa 5 Lab test data at LBNL, with help from Frank Gaede;

VtxRawHits: An example of CMOS Pixel Hits implementation in LCIO

❖ Create VtxRawHits:

```
VtxRawHits* vtxData = new VtxRawHits(aDataFileName,aFrame);
LCWriter* lcWrt = LCFactory::getInstance()->createLCWriter();
```

❖ Create and fill header with chip geometry information:

```
string detName("MIMOSA V - det02");
runHdr->setDetectorName( detName );
runHdr->parameters().setValue( "NRows" , vtxData->getNRows());
...
```

❖ Store ADC, Noise and Pedestal (if update online), otherwise, just store ADC and read initialisation Noise and Pedestal from Condition Database;

```
TrackerRawDataImpl* vtxRaw = new TrackerRawDataImpl ;
vtxRaw->setCellID0(vtxData->getIndex(iRow,iCol,aFrame)) ;
vtxRaw->adcValues().resize(3);
vtxRaw->adcValues()[0]=10*vtxData->getADC(iRow,iCol,aFrame);
...
```