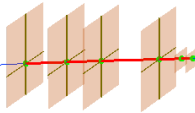# Test Beam Event Display

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basf2 Event Display

- Implemented as a basf2 module (`Display`), reading data objects created by other modules
- Interactive 3D display using TEve
- Uses TGeo geometry converted from Geant4
- Can show geometry, MCParticles + SimHits, and fitted tracks + RecoHits

Documentation: https://belle2.cc.kek.jp/~twiki/bin/view/Computing/EventDisplay

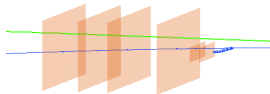Can the Display module be reused for the VXD test beam setup?
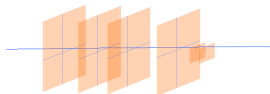Example steering file: `basf2 testbeam/vxd/examples/display.py`
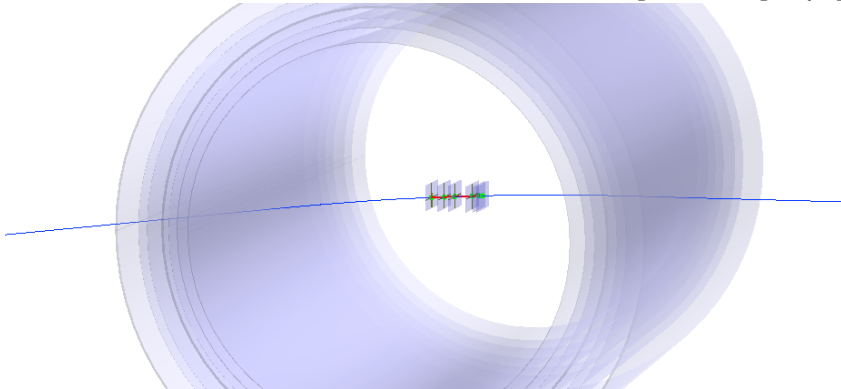
What should be shown?

- Test beam geometry ✓
- High-level objects from simulation/reconstruction ✓
- PXDClusters sufficient? Pixels needed?
- Telescope hits – still missing, can be added
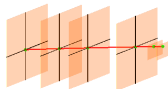- ROIs – no data format yet
- … ?

MCParticles & SimHits

Track candidates

Fitted tracks

Requirements for Online Usage

Events should be shown while they come in, without interrupting basf2.

Tx

Ring Buffer

Rx

Display

Main Process   Display Process
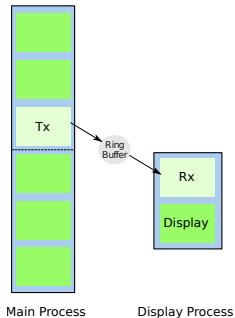
- Display needs to be decoupled from main process
- `AsyncDisplay`: Prototype module that buffers events and shows them in a separate process
- How to sample events? (events in ring buffer will be overwritten once filled, next event is likely 'old')
- Store only current, next and previous event?

Event

4

Delay (s): 3.5

Current UI for changing events

Where to put it?

Prerequisites for using the display
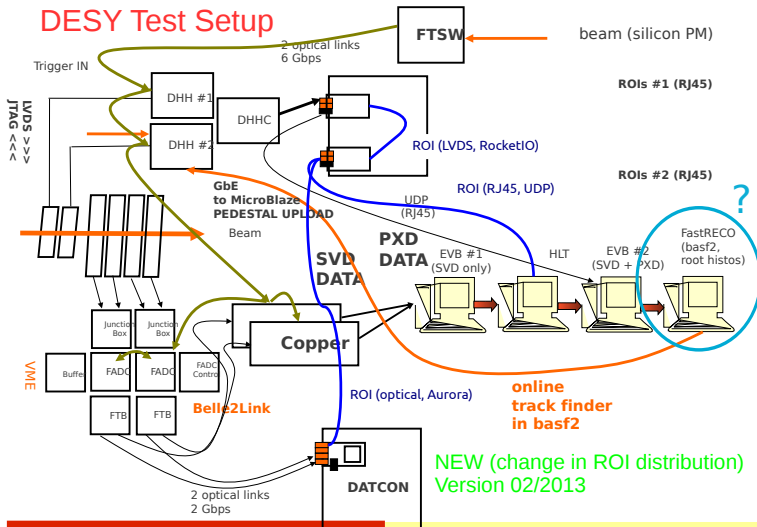
- basf2
- Input: normal objects (clusters, GFTracks, ...)
- OpenGL (acceleration not strictly required)
- Could be run on the event builders directly, or receive data over network

Where to put it?

DESY Test Setup

Trigger IN

LVDS >>>
JTAG ^^^

2 optical links
6 Gbps

FTSW

beam (silicon PM)

DHH #1

DHHC

DHH #2

ROIs #1 (RJ45)

ROI (LVDS, RocketIO)

GbE
to MicroBlaze
PEDESTAL UPLOAD
Beam

ROI (RJ45, UDP)

UDP
(RJ45)

ROIs #2 (RJ45)

SVD DATA

PXD DATA

EVB #1
(SVD only)

HLT

EVB #2
(SVD + PXD)

FastRECO
(basf2,
root histos)

?

VME

Junction
Box

Junction
Box

Buffer

FADC

FADC

FADC
Control

FTB

FTB

Copper

ROI (optical, Aurora)

Belle2Link

**online
track finder
in basf2**

2 optical links
2 Gbps

DATCON

NEW (change in ROI distribution)
Version 02/2013

Open Questions

- What needs to be added to make the display useful for the test beam?
- Who'll take care of SVD-DAQ format $\leftrightarrow$ basf2 SVD objects translation?
- Who'll install software on event builders, HLT, FastRECO?
- After ROIs are created from track candidates (Pisa people), how are they distributed? Available in basf2, too?