Status of STT Simulator

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Outline

- Overview
- Status
- Near Term To Do List

Developers

- Original Developer
  - Silvia Tentindo–Repond
- Current Developers/Testers
  - Todd Adams, John Hobbs, Harrison Prosper, Wendy Taylor
- Other contributors/consultants/helpers/code–breakers
  - Dugan, Kevin Black, Bill Lee, Vivek Jain, Meena, Roger, Lars Sonnenschein, Jodi Wittlin, crazy old Maurice and anyone else who was willing to beat on the code!

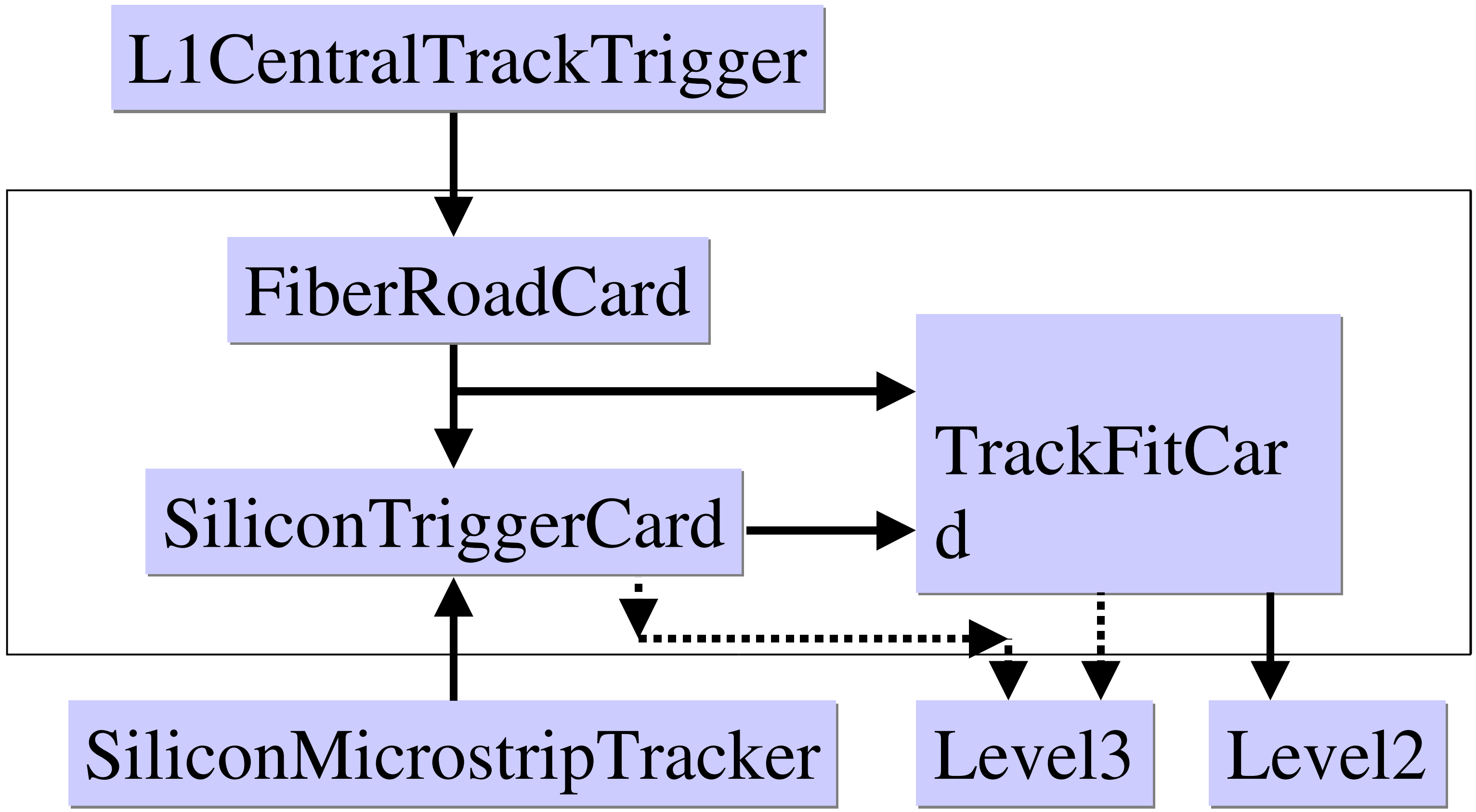
Silicon Track Trigger (STT)

- Purpose
  - Find and fit tracks in the Silicon Microstrip Tracker (SMT) at L2 and send results to the L2 Central Track Trigger (L2CTT)
- Algorithm
  - Find clusters of hits in the SMT
  - Find which SMT clusters lie within a given road (= track plus a “window”) provided by the L1 CTT
  - Fit the clusters to a track to obtain, in particular, its impact parameter.

STT Simulator

- Packages
  - tsim_l2stt (HP, TA)
  - l2stt_util (HP, WT, JH)
  - l2stt_fitting (WT, JH)
  - l2stt_analyze (HP, TA)

STT Simulator – Basic Structure



STT Simulator Uses

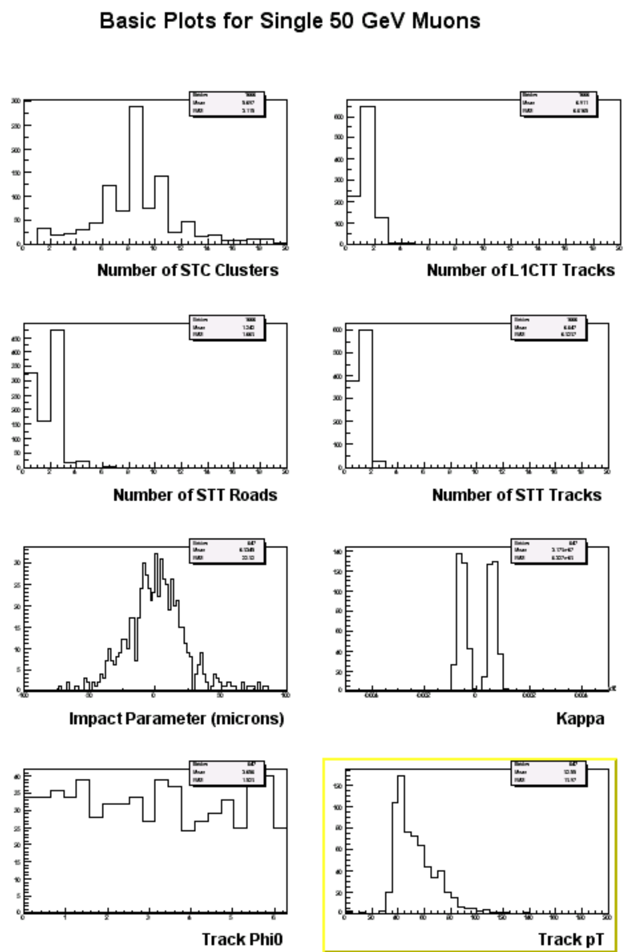
- Provide simulation of STT for general use by D0 collaboration
- Provide platform for developing STT algorithms
  - such as track fitting/clustering
- Provide tools to aid commissioning of the STT hardware/firmware

Status

- **The Good**
  - Works within the **tsim_l1l2** framework
  - Tested, and works, on single muons as well as on complicated Monte Carlo events (e.g., ttbar)
  - Works with **t02.35.00**
- **The Bad**
  - As yet, no documentation,…but is coming!
  - A bit of a memory hog (uses huge lookup tables)
- **The Ugly**
  - Does not as yet output to L3, therefore, l2stt_analyze will not work with real events

Monitoring Plots

- Have added a system to produce standard histograms
  - l2stt_analyze
- Includes basic plots
  - fit results
  - number of tracks
  - number of clusters
- Includes residual plots
  - using generated and reconstructed tracks



Near Term To Do List

- Test Vectors for Commissioning
  - Need SMT to STC, FRC to TFC, STC to TFC, TFC to L2, TFC to L3, STC to L3.
- Level 3
  - Write output to RawDataChunk in correct Level3 format
  - Upgrade l2stt_analyze to use Level3 objects
- smtutil
  - Get correct sequencer and HDI numbers from STT database.