Muon Timing

Boris Baldin

In order to generate correct event data every D0 front-end system has to be in sync with the TFW and the beam. The following steps are needed to adjust muon sub-system timing:

- **synchronization to the D0 TFW (set pipeline delay)**
- **synchronization to the beam (set beam delay)**
- **finer gate timing adjustment (usually this is what we do first)**

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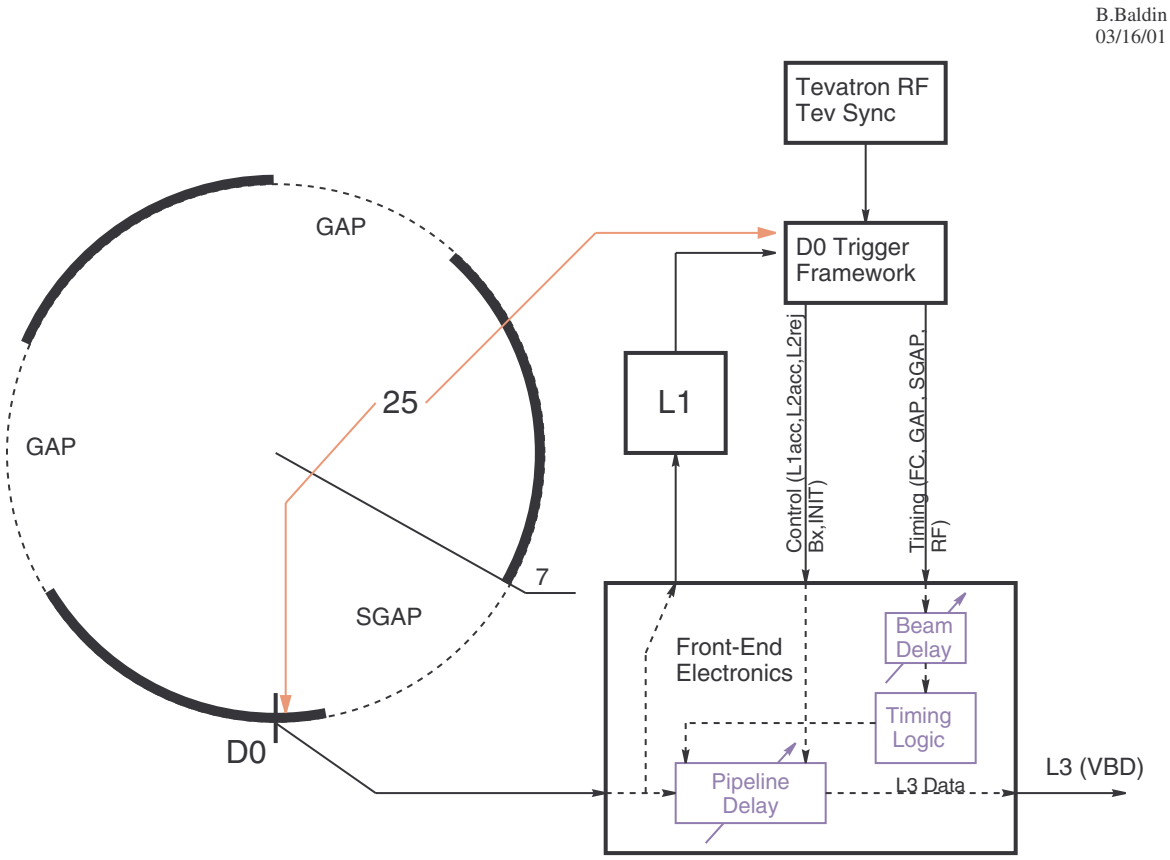

Figure 1. D0 DAQ timing scheme

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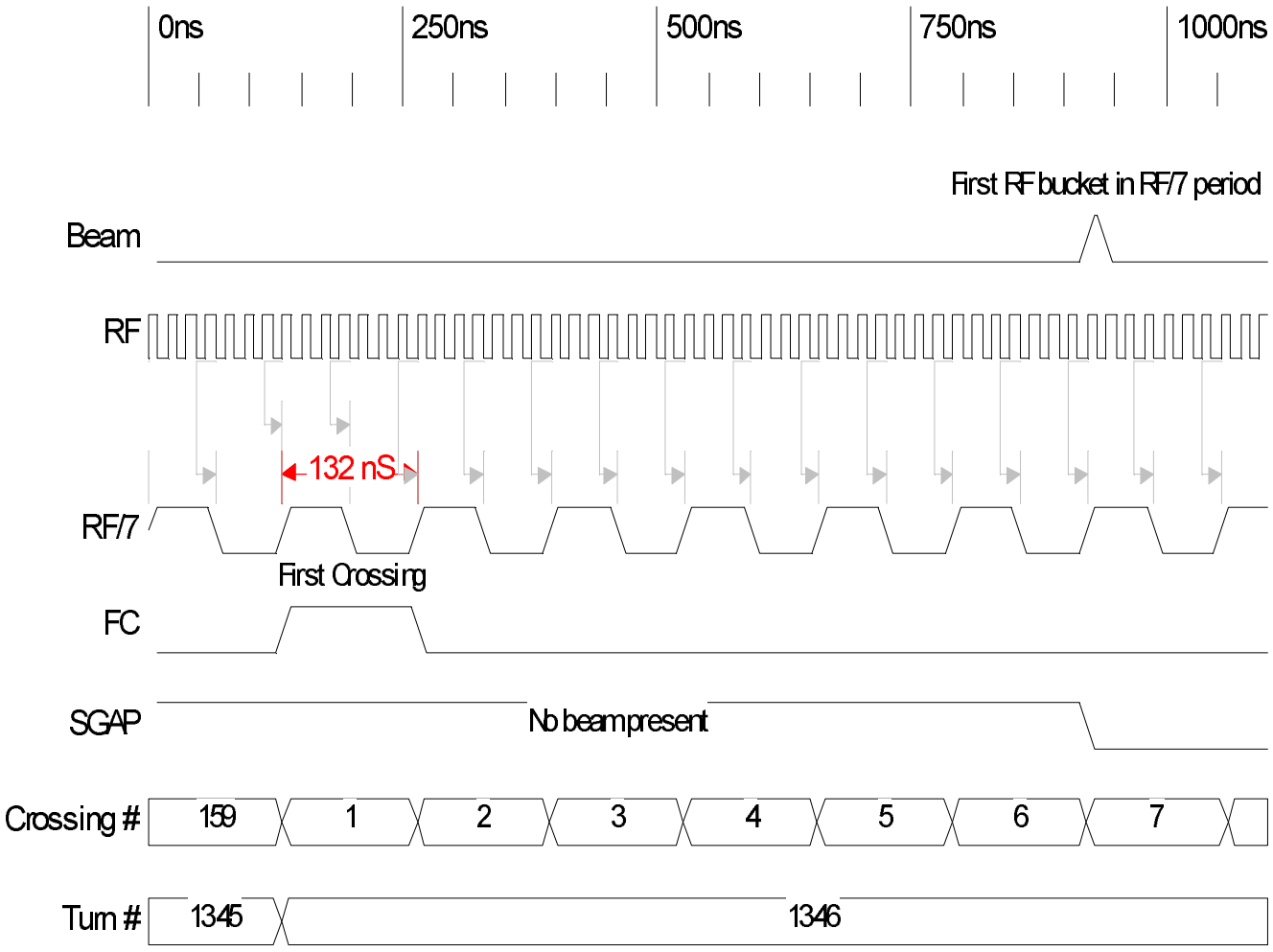

Figure 2. D0 Trigger Framework Timing signals

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Procedures to perform timing adjustments in muon sub-systems:

- synchronization to the TFW
  - setup fixed trigger decision mode in TFW
  - setup test pulser to generate event at the expected crossing
  - adjust pipeline depth to achieve correct event sync
- synchronization to the beam
  - set maximum gate width and zero delay
  - collect data with the beam
  - analyze histogram: event data vs crossing number, and adjust beam delay if necessary
  - verify that event synchronization is still correct, otherwise repeat previous procedure
- finer gate adjustment (usual)

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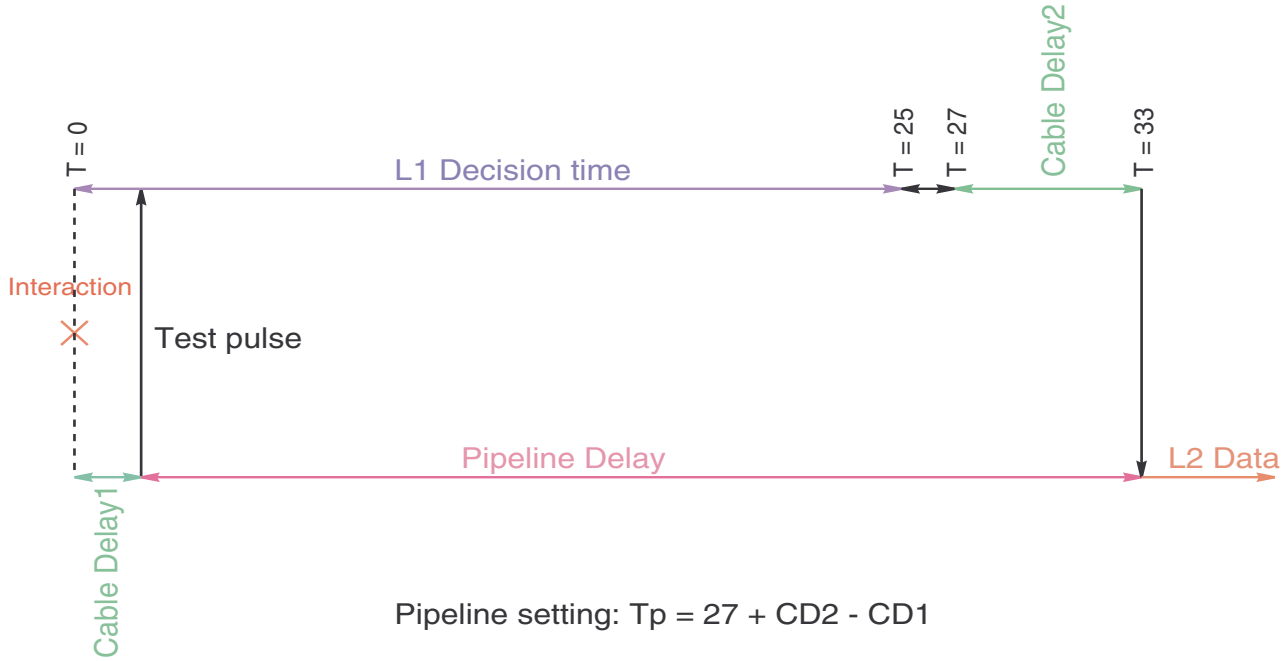
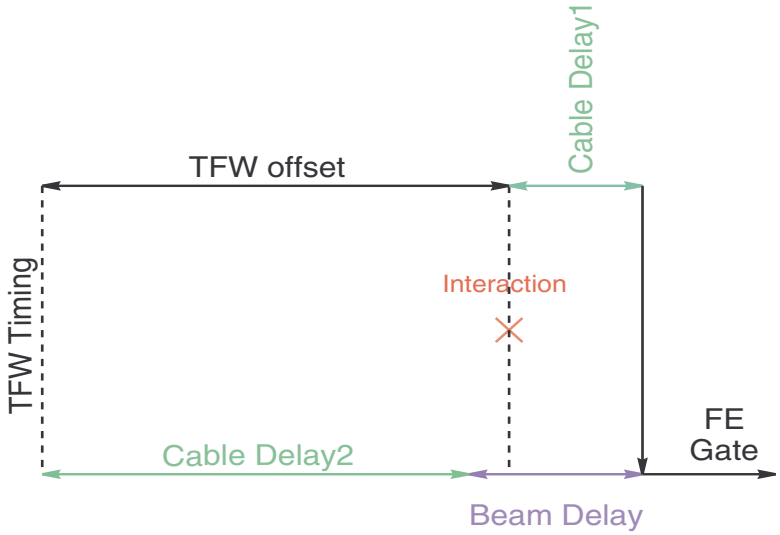


Pipeline setting: Tp = 27 + CD2 - CD1



Beam Delay setting: Tb = TFWoffset + CD1 - CD2