In-time vertexing with INTT

Sookhyun Lee (Iowa State University)

November 1, 2018

Towards finalizing plots for in-time vertexing

- Vertex evaluator has been updated and reorganized so that more differential analysis is possible, i.e.
  - as a function of number of tracks as well as vertex multiplicity.

- Performance evaluation has been done with
  - In-time vertex identification efficiency
  - Out-of-time vertex rejection factor
  - Vertex timing purity

$$\text{Efficiency} = \frac{\text{\# of vertices tagged as in-time}}{\text{\# of true in-time vertices within [-20ns,80ns] time window}}$$

In-time vertex id Efficiency
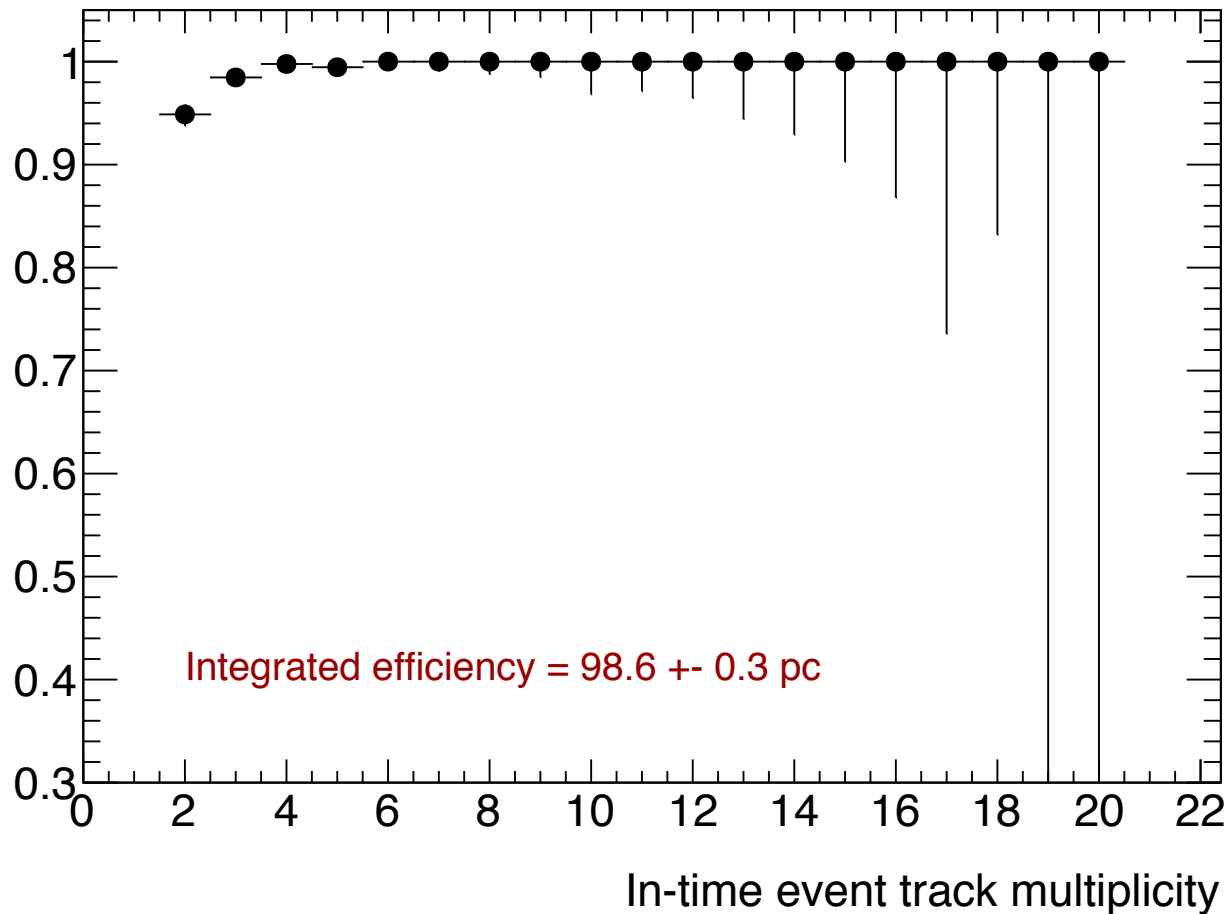

Integrated efficiency = 98.6 +- 0.3 pc

In-time event vertex multiplicity
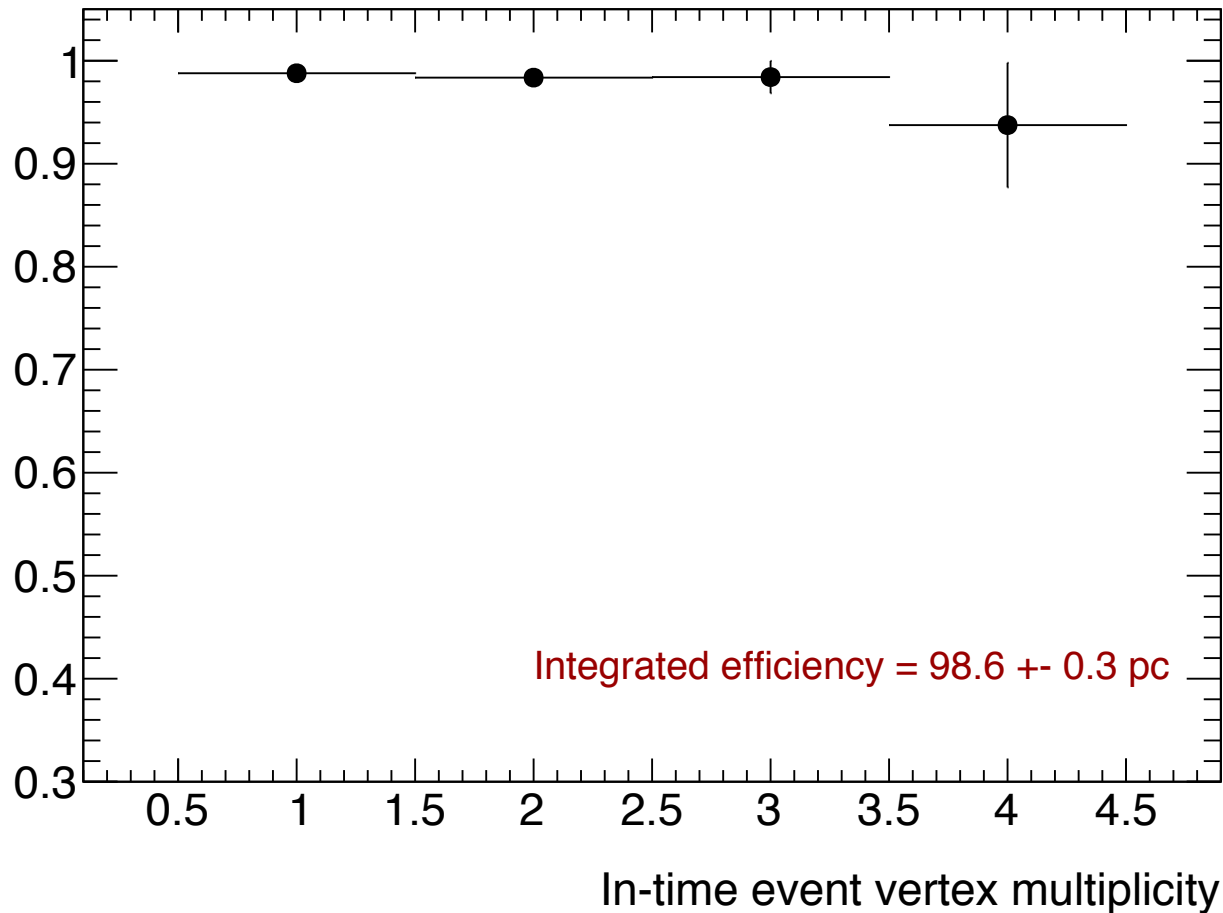
- Event vertex multiplicity is defined as, throughout this report, the number of event vertices with more than 1 associated track within MVTX acceptance, |zvtx|<10, |eta|<1, and pt>0.5.

$$\text{Efficiency} = \frac{\text{\# of vertices tagged as in-time}}{\text{\# of true in−time vertices within [-20ns,80ns] time window}}$$

In-time vertex id Efficiency
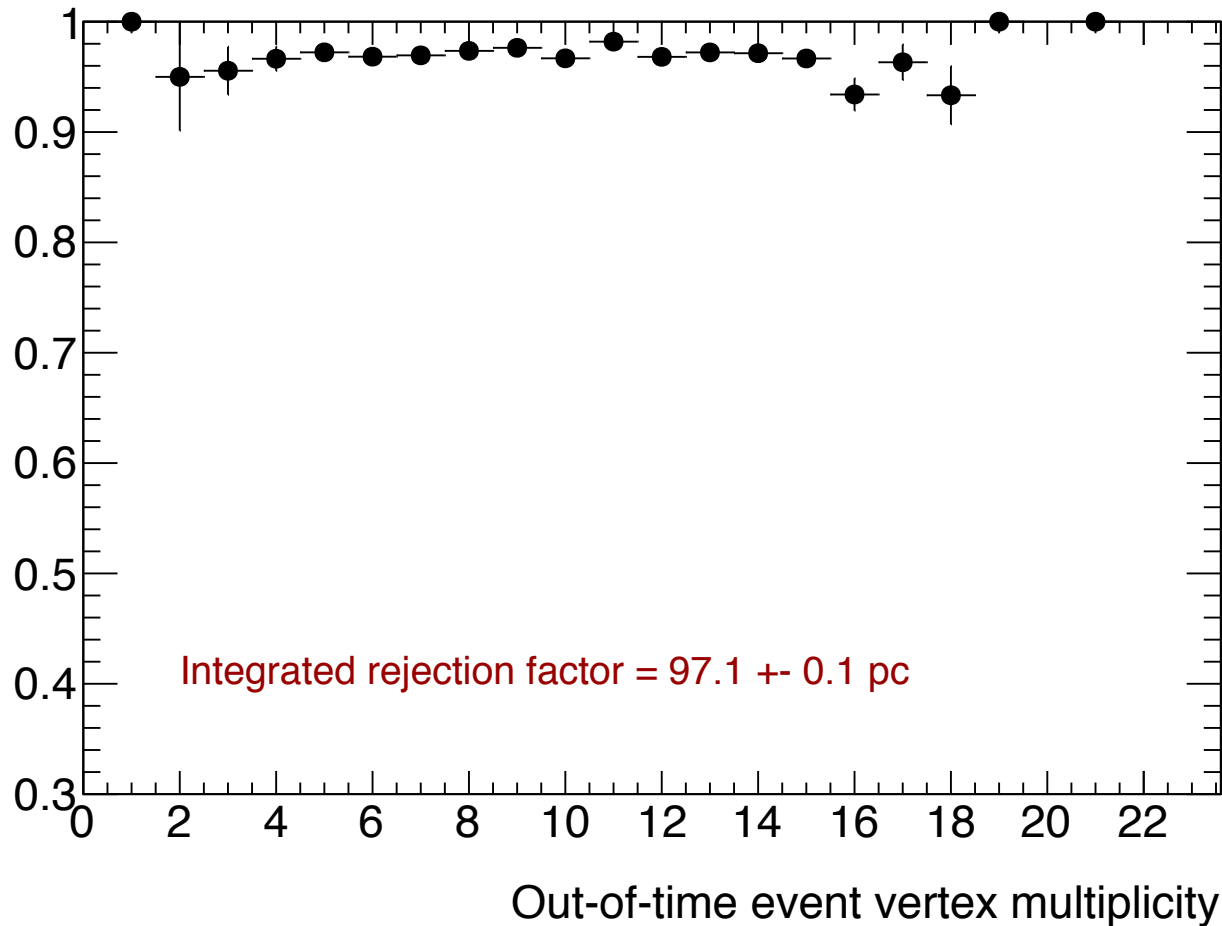

Integrated efficiency = 98.6 +- 0.3 pc

In-time event track multiplicity

- Track multiplicity is defined as the number of tracks in an event within MVTX acceptance, |zvtx|<10, |eta|<1, and pt>0.5.

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Out-of-time vertex rejection factor

Integrated rejection factor = 97.1 +- 0.1 pc

Out-of-time event vertex multiplicity

- Event vertex multiplicity is defined as the number of event vertices with more than 1 associated track within MVTX acceptance, |zvtx|<10, |eta|<1, and pt>0.5.

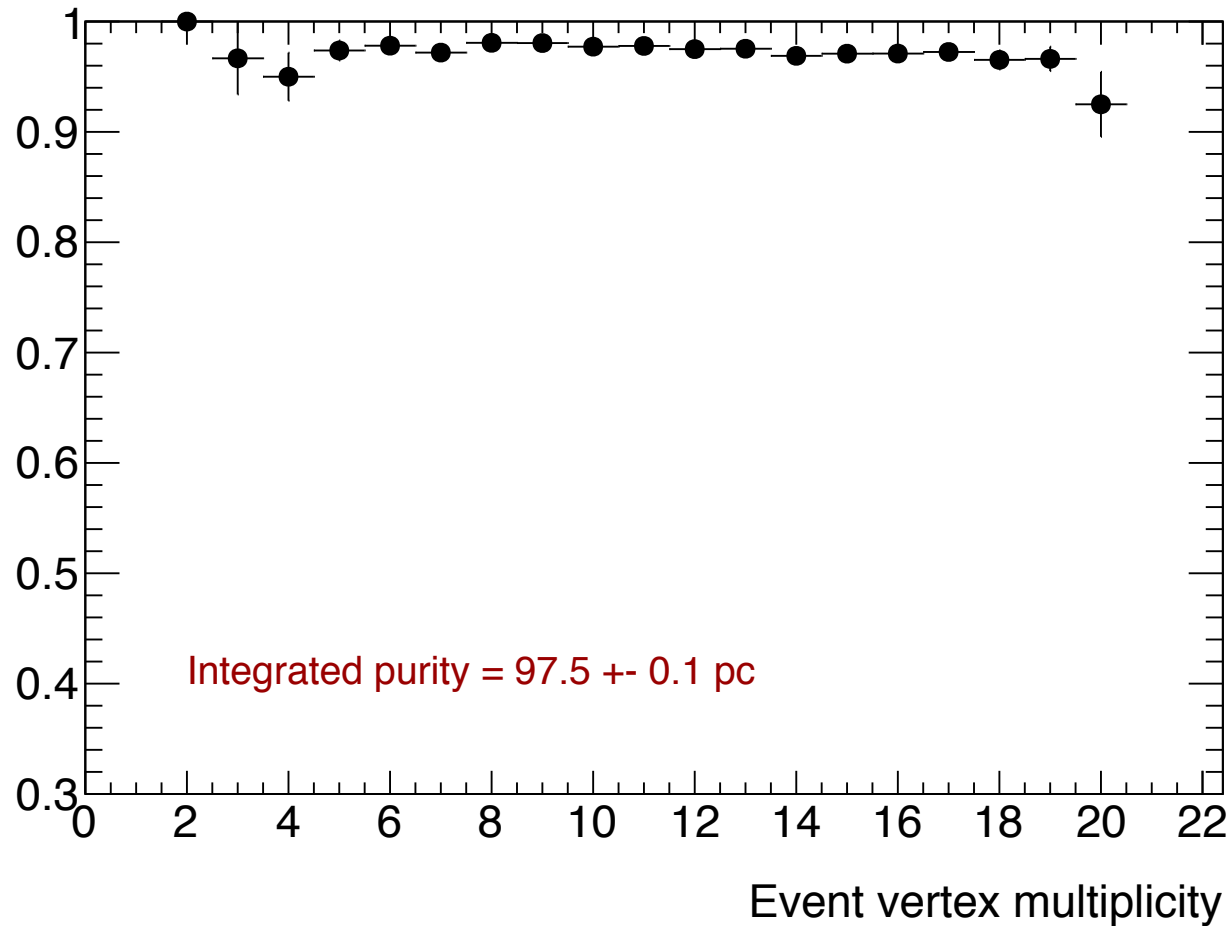# Out-of-time vertex rejection factor

As a function of track multiplicity
* Need to run simulation again to store missing info

Vertex timing purity

Integrated purity = 97.5 +- 0.1 pc

Event vertex multiplicity

Vertex timing purity

As a function of track multiplicity
* Need to run simulation again to store missing info