

The Event Buffer Management for MT-SNiPER

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SNiPER is a general purpose offline software framework for high energy physics experiment. It provides some features that is attractive to neutrino experiments, such as the event buffer. More than one events are available in the buffer according to a customizable time window, so that it is easy for users to apply events correlation analysis.

We also implemented the MT-SNiPER to support multithreading computing based on Intel TBB. In MT-SNiPER, the event loop is split into pieces, and each piece is dispatched to a task. The event buffer management becomes more complicated in this case.

The global buffer, an extension and enhancement to the event buffer, is implemented for MT-SNiPER. The global buffer is available by all threads. It keeps all the events being processed in memory. When there is an available task, a subset of its events is dispatched to that task. There can be overlaps between the subsets in different tasks due to the time window. However, it can be ensured by the global buffer that each event is processed only once. In the task side, the subsets of events are locally managed by a normal event buffer. So the global buffer can be transparent to most user algorithms. Moreover, the global buffer can be used to keep all events in right order.

Within the global buffer, the multithreading computing of MT-SNiPER becomes more practicable.

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