Mu2e-doc-1943-v1

Event Mixing Neutron Backgrounds

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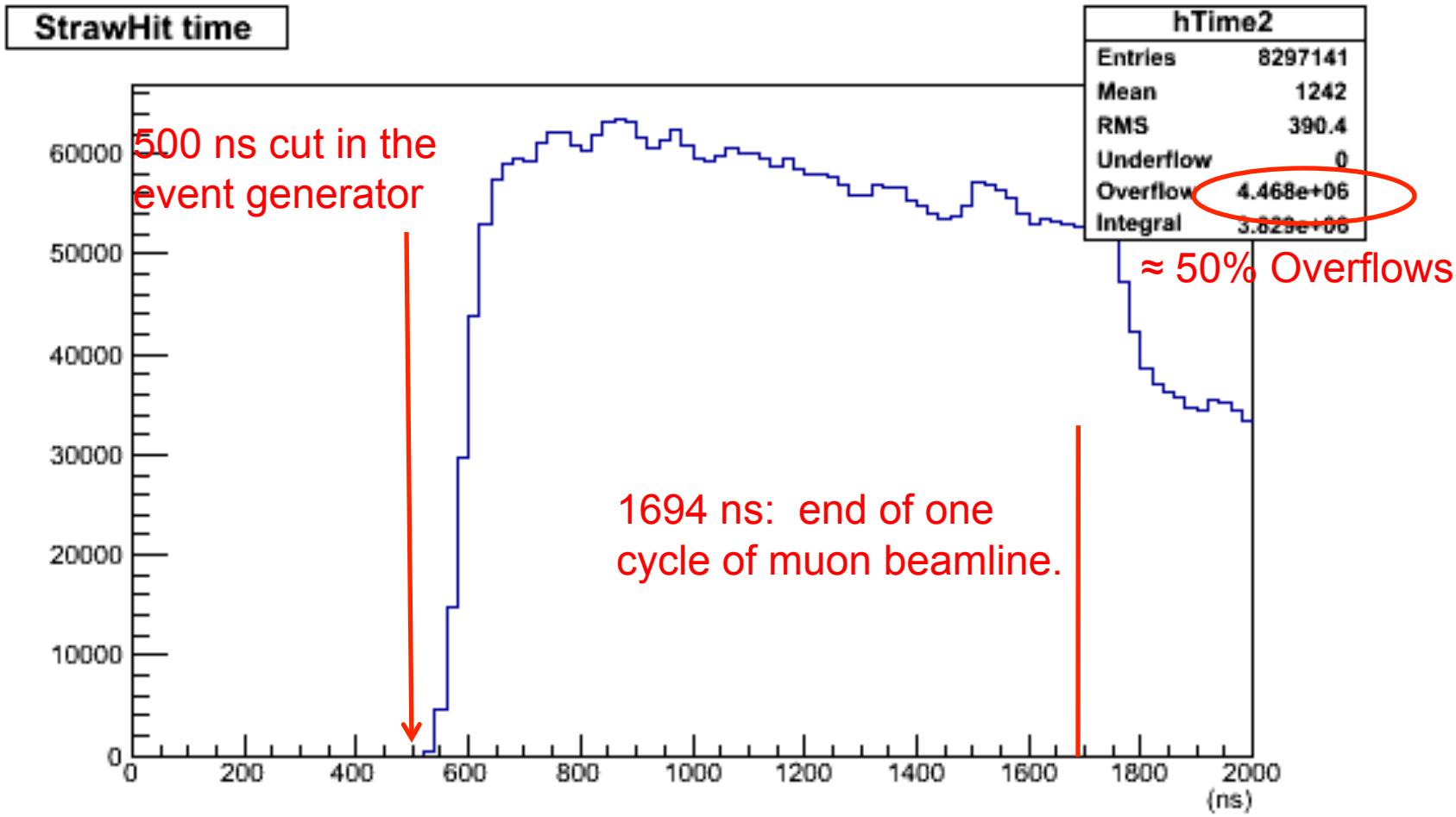
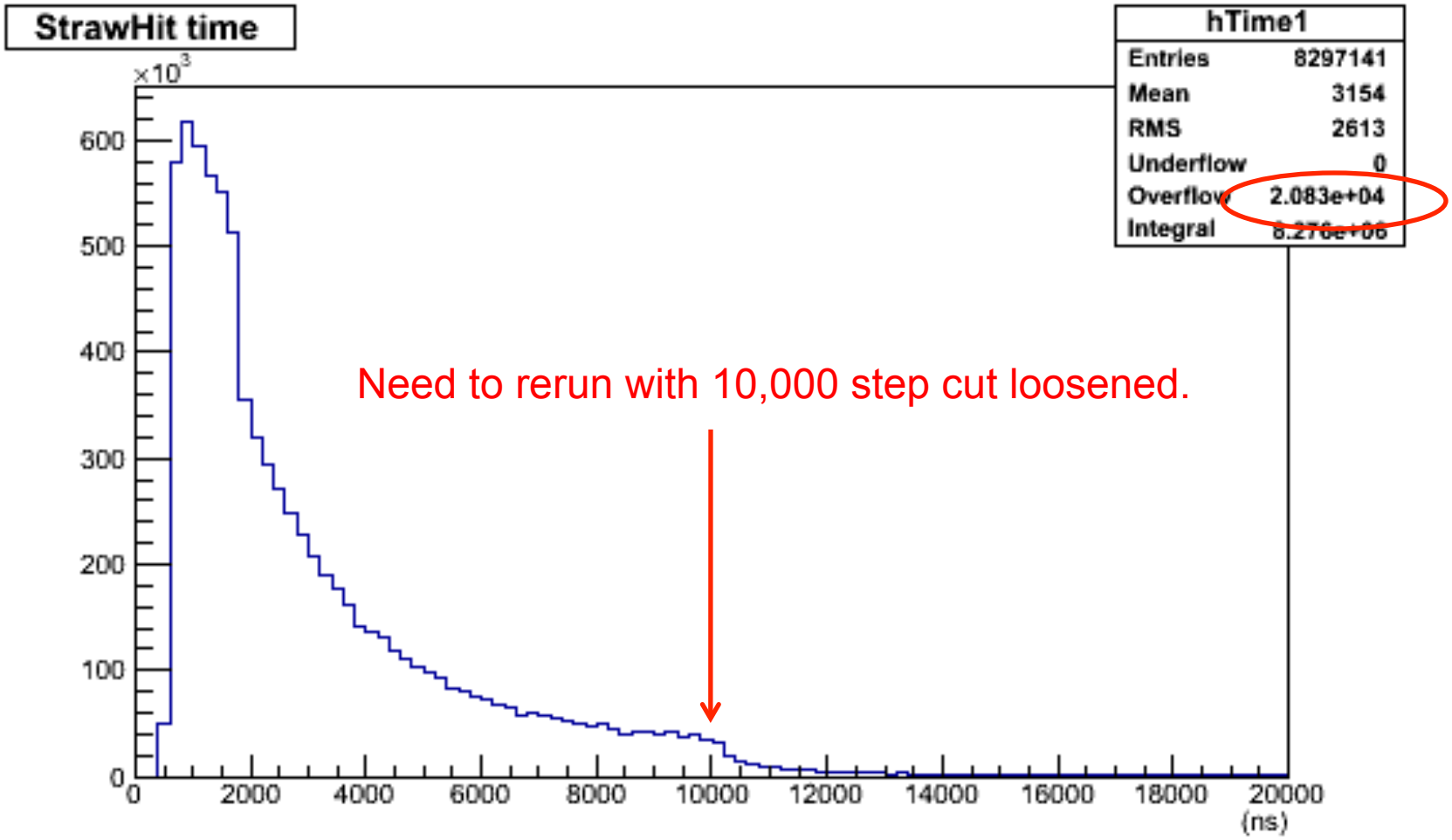
Software and Simulation Meeting

November 16, 2011

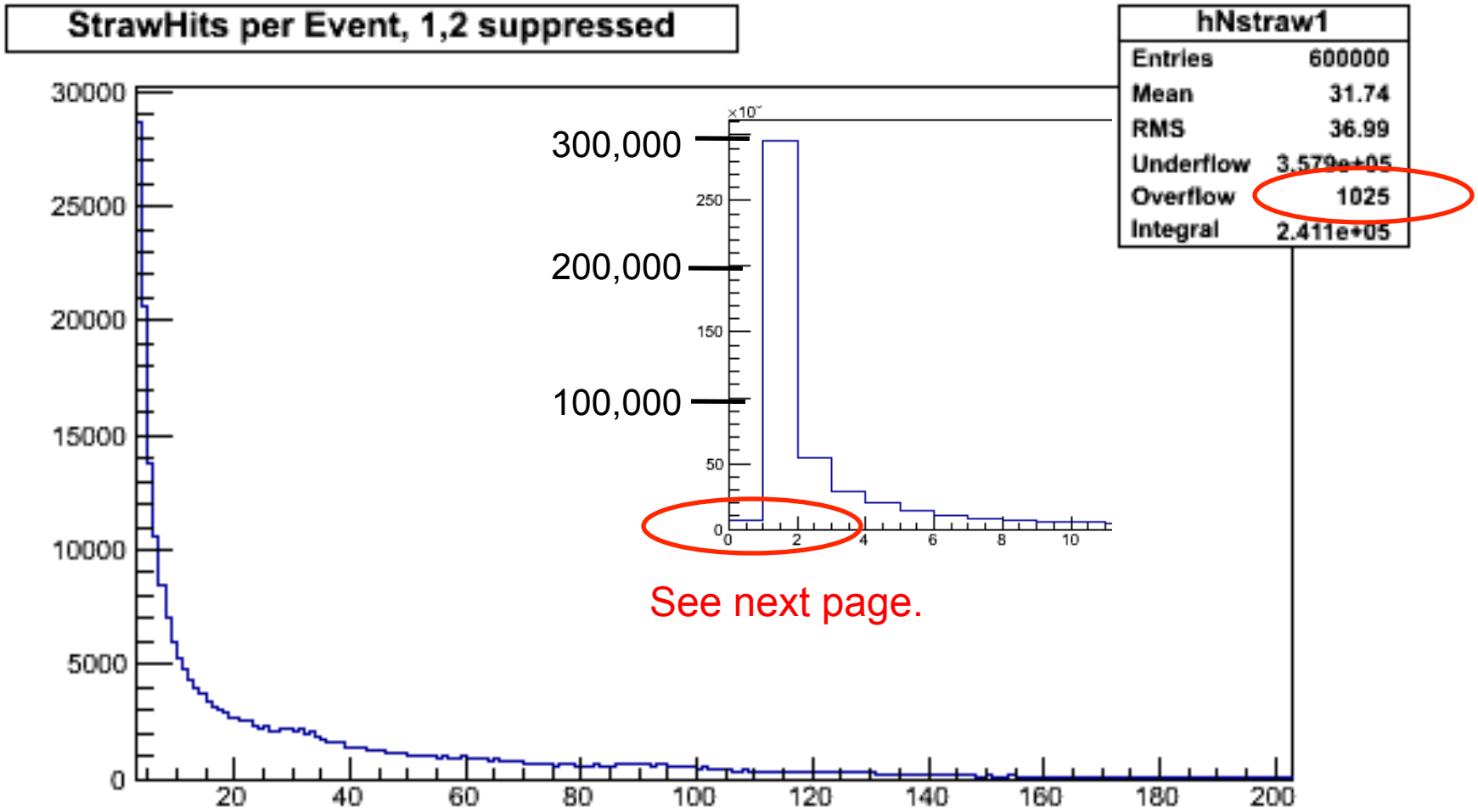
StrawHits from EjectedNeutronGun



Zoom out to Long Time



Number of StrawHits/Event



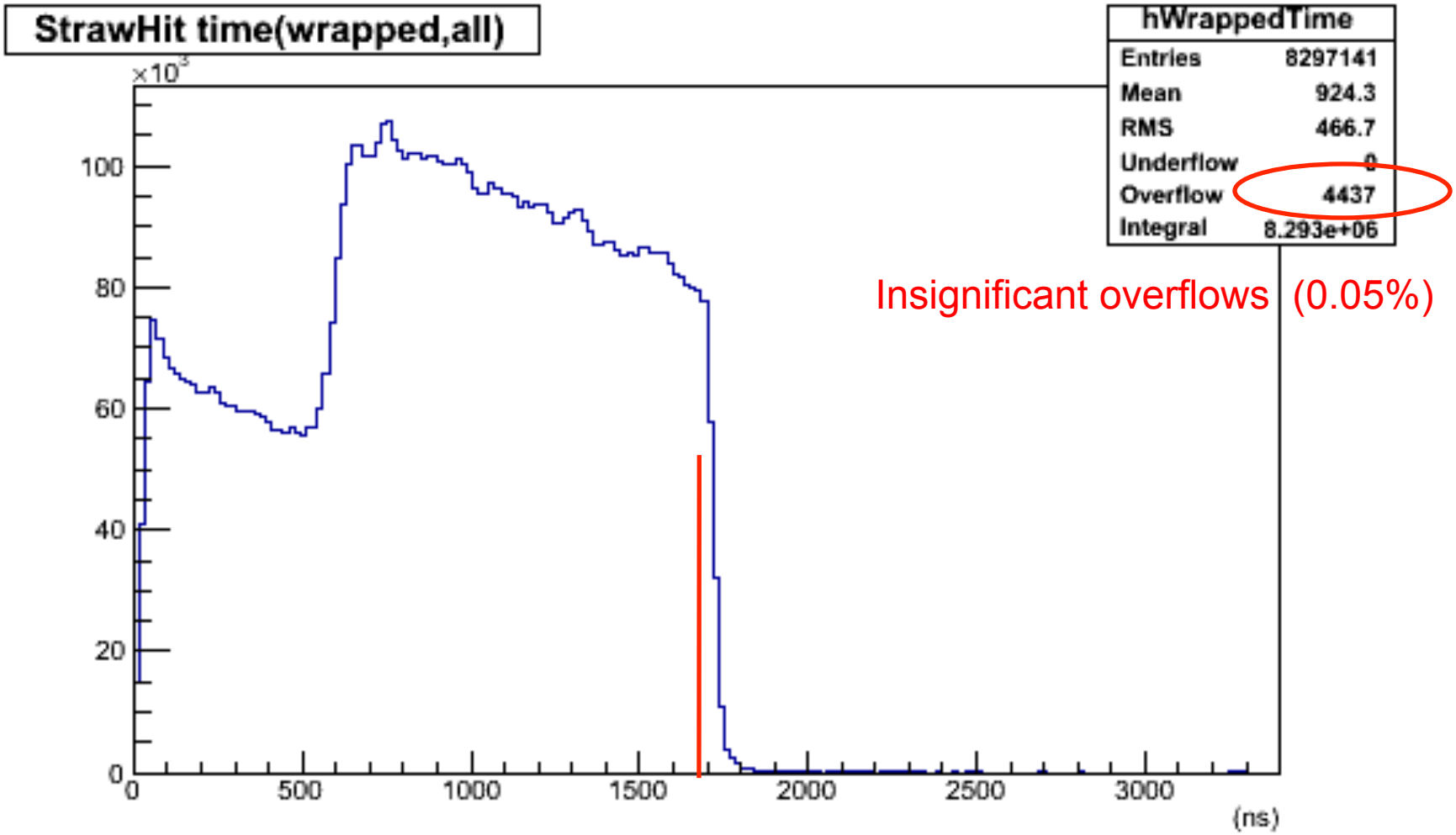
Events with No Hits

- HitMaker requires that the hit have at least 100 eV of deposited energy.
  - 7,155 of 600,000 events have zero StrawHits

Counting Buckets

- Slice time into buckets:
  - 0…1694 ns
  - 1694…3338
  - 3388…5028
  - and so on
- On each event, shift times backward so that first hit is in the range 0…1694 ns

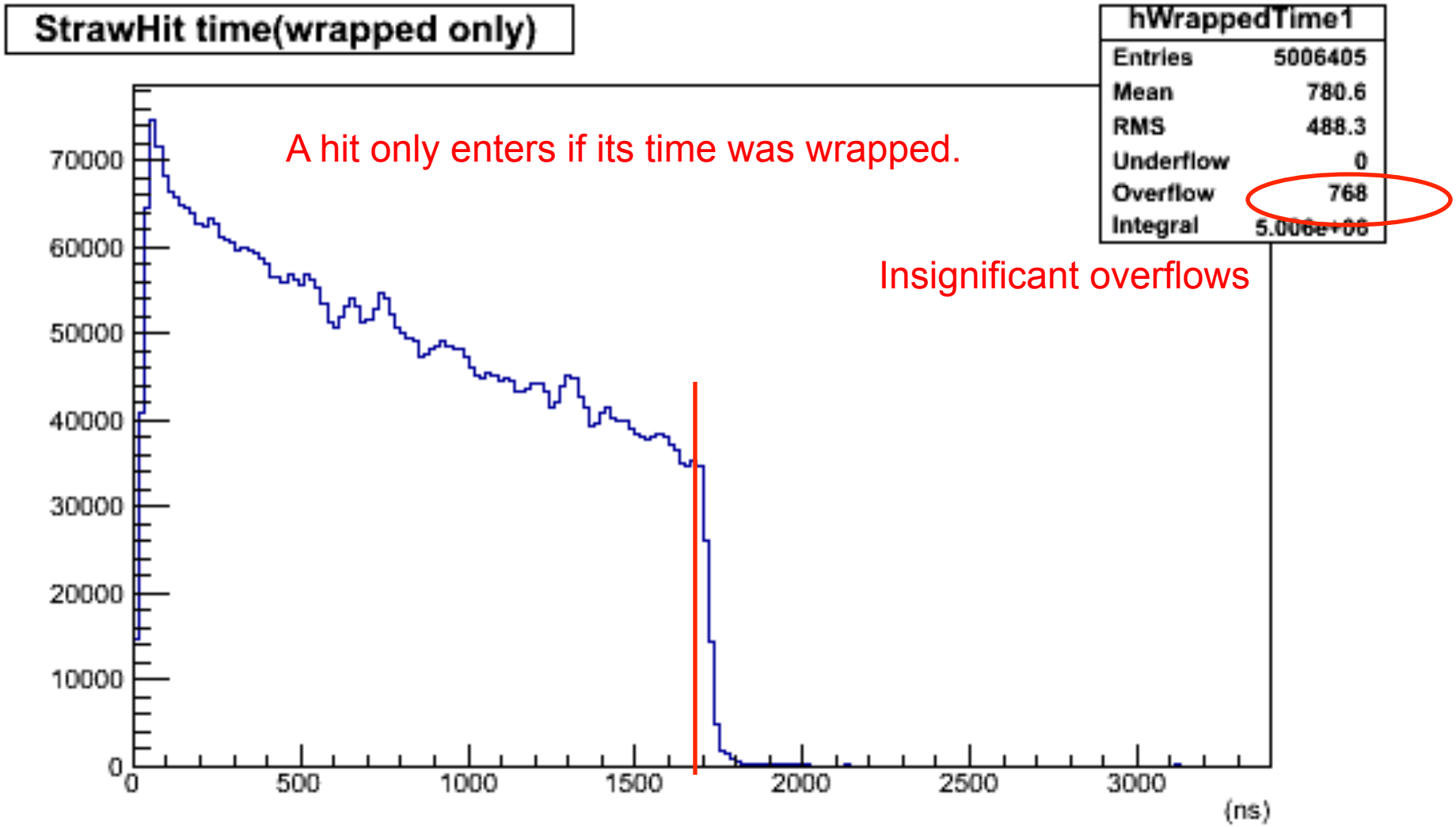
StrawHits Wrapped in Time



Counting Buckets

- Numerics:
  - 7155: events with no hits
  - 585097: hits fall into 1 bucket
  - 7738: hits fall into 2 buckets
    - Almost all adjacent buckets
  - 10: hits fall into 3 buckets
  - 0: hits fall into 4 or more buckets
  - 600000

StrawHits: Wrapped Only



A Possible Algorithm

- Split neutron file into many files:
  - Current bucket
  - Bucket n-1
  - Bucket n-2
  - and so on
- Make a separate mixing module for each bucket.
  - Tedious but it works.
- Would much prefer an algorithm that lets me choose N events and shift some, all within one module.