Using MC event times as seed times for Time-based simulations

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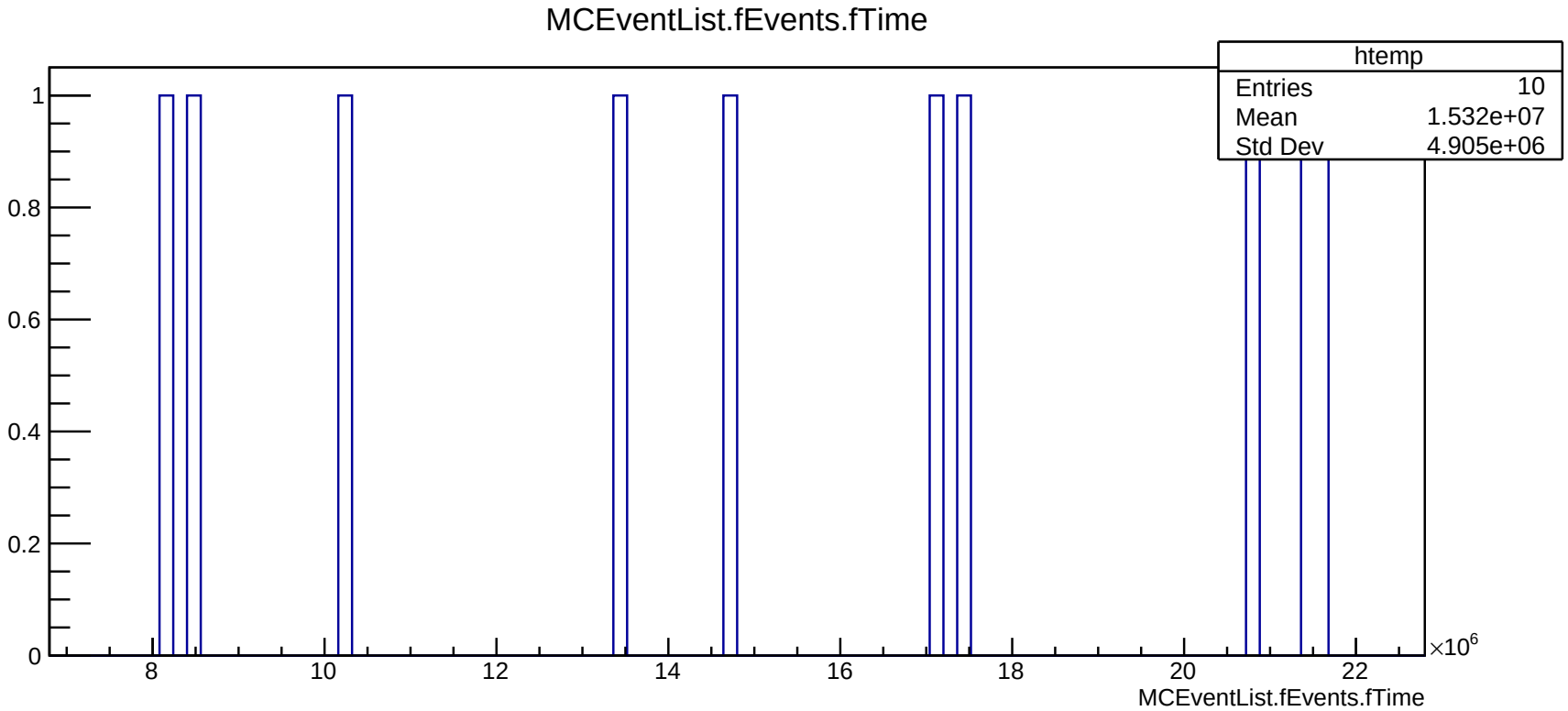
The Goal

- Use information from raw.root (fTime in branch MCEventList.) as a list of seed times for an event builder



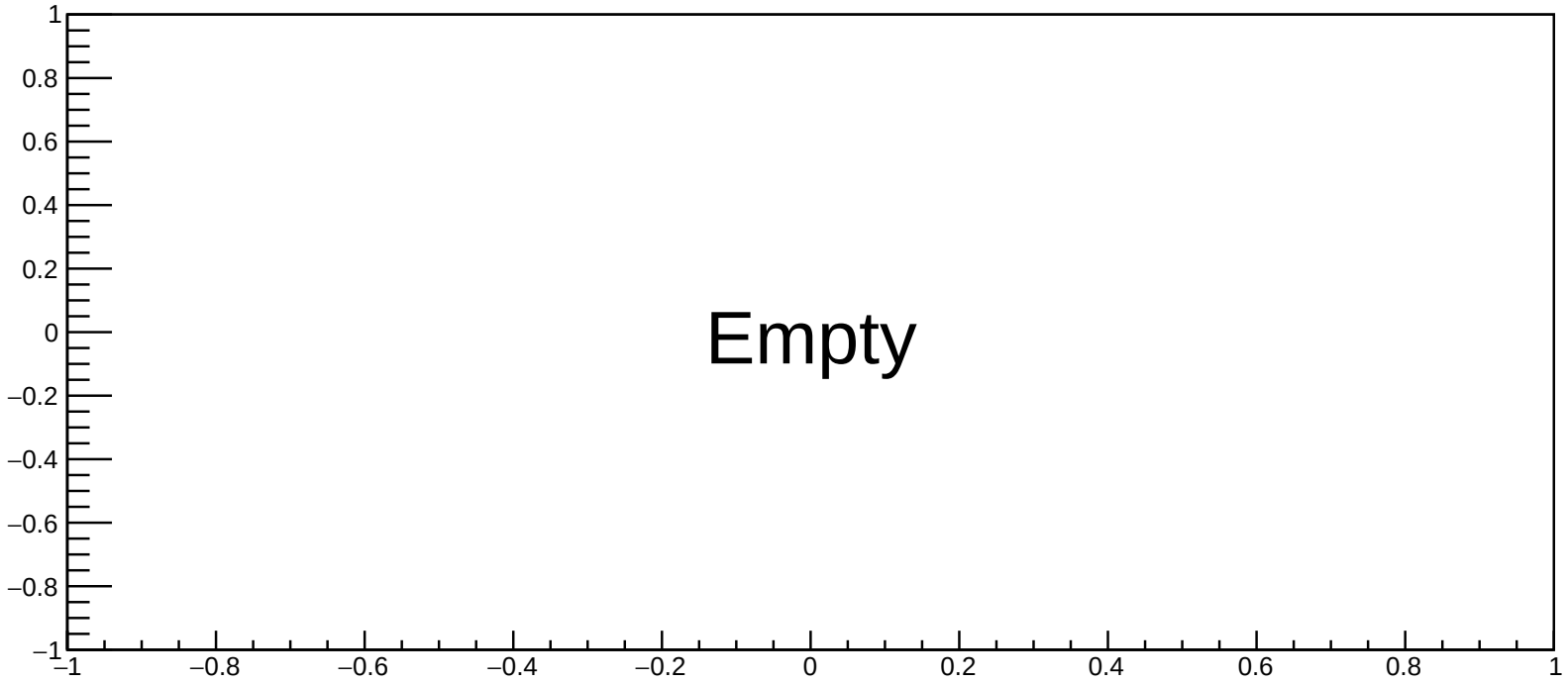
Ideal mode of Sliding Window Seed Finder (SWSF)

- A function inside the SWSF that has nothing to do with SWSF, but does exactly what we want

```
197
198   if (fbIdealMode) {
199     if (!FairRootManager::Instance() || !FairRootManager::Instance()->GetObject("MCEventList.")) {
200       LOG(error) << "No MC event list found";
201       return;
202     }
203     fEventList = (CbmMCEventList*) FairRootManager::Instance()->GetObject("MCEventList.");
204   }
205 }
206
```

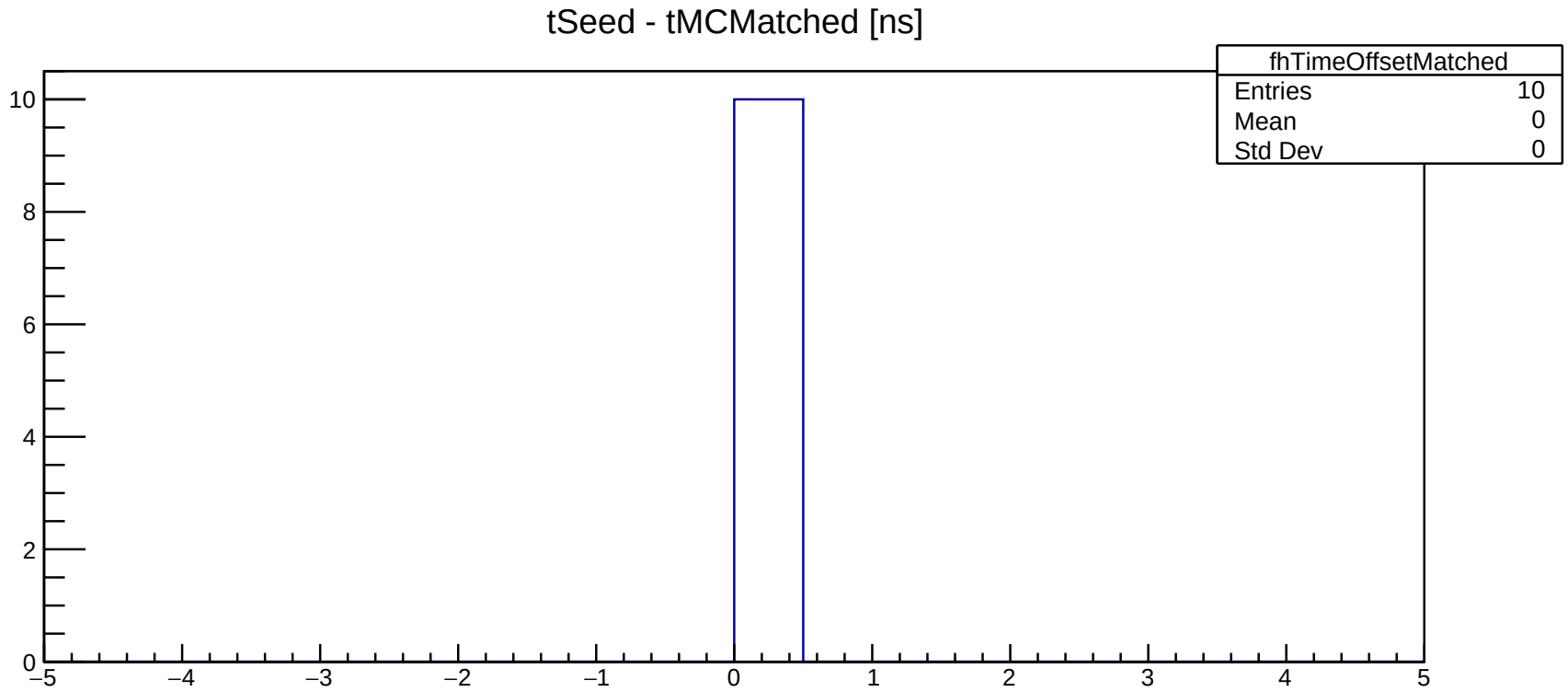
Issue with the ideal mode

- When turned on in the `run_reco_json_config.C`, the ideal mode did not give any results



Seed finder QA

- Perfect results for the seed finder QA
- No results for event builder QA or reconstruction (but also no crash or error)



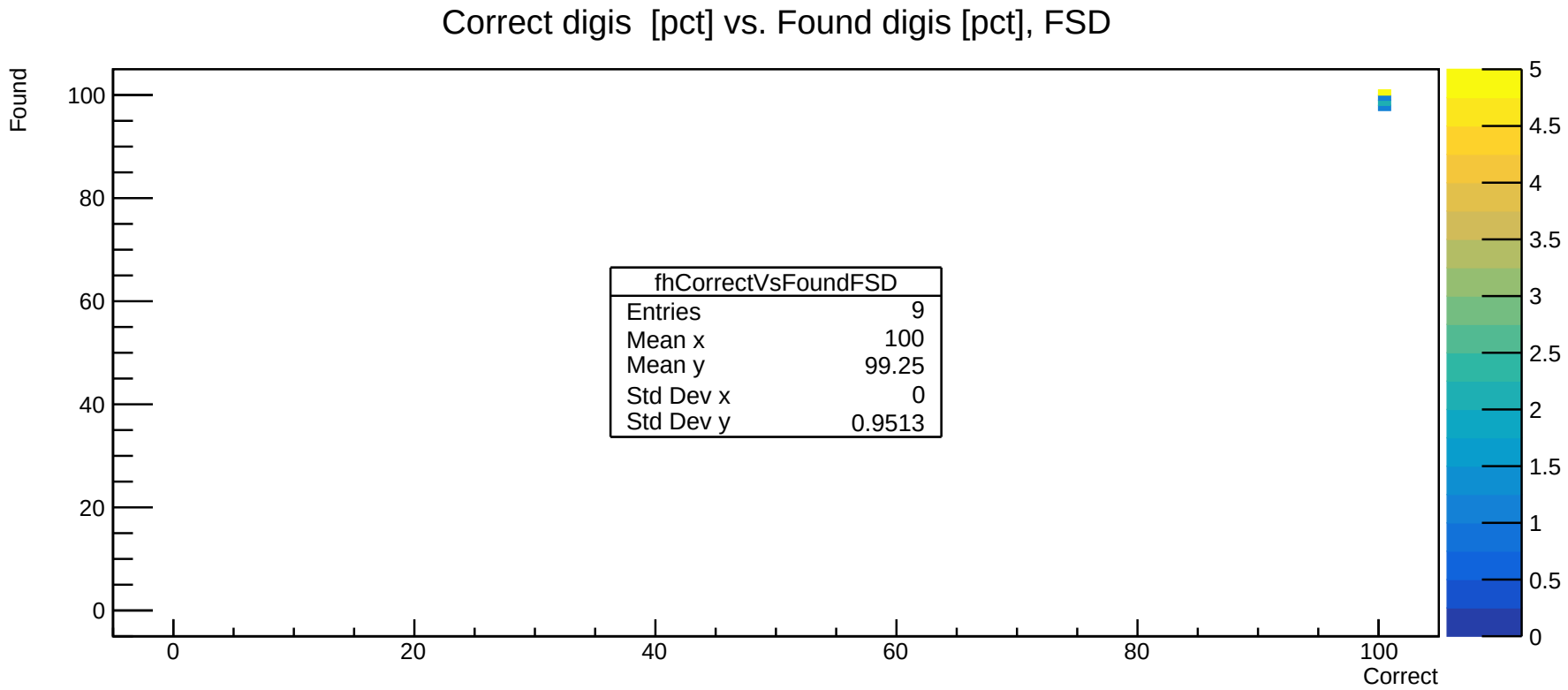
A lot of tedious work...

All seeds get rejected

- Many checks the seed and the event need to pass before being accepted and stored
- No digis were ever found in the set window around any of the MC seeds: all seeds rejected before even building an event
- The MCEventList. stores event times in the absolute time (0 ns being the start of the whole simulation)
- Digis are stored in the relative time (0 ns is the start of the corresponding timeslice)
- Comparing event times in the orders of 10^7 ns and digi times in the orders of 10^5

Solution

- Before using the MCEventList. data as seeds, shift every event time using the start time of the corresponding timeslice
- Implemented and working



Pending issues

- The seed finder QA: still using absolute time, therefore useless
- Window for event building maybe not optimal: loosing digis