

# LAr-trigger development

**Simranjit Singh Chhibra (QMUL)**

Combined PP/DS meeting, 9 September 2024

<https://indico.fnal.gov/event/66040/>

# Technicalities

- Started from [github.com/wesketchum/dunetrigger.git@develop](https://github.com/wesketchum/dunetrigger.git@develop)
- Input raw data:  
np04hd\_raw\_run028508\_0000\_dataflow0\_datawriter\_0\_20240730T160245.hdf5
- Decoded using `example/run_pdhd_tpc_decoder.fcl` from hamza/docs branch
- **ADCSimpleWindow algorithm**
  - Fill a TP window with TPs for a given `widow_length` (default is 10k DTS ticks)
  - Construct a TA if `adc_integral > adc_threshold`
- **New code (branch [schhibra/ADCSimpleAlgorithm\\_TAMaker](#)) :**
  - `dunetrigger/TriggerSim/TAAlgTools/TPWindow.hh`
  - `dunetrigger/TriggerSim/TAAlgTools/TAAlgTPCADCSimpleWindow.hh`
  - `dunetrigger/TriggerSim/TAAlgTools/TAAlgTPCADCSimpleWindow_tool.cc`
  - `dunetrigger/TriggerSim/TAAlgTools/CMakeLists.txt`
  - `dunetrigger/TriggerSim/TAAlgTools/TAAlgTPCTool.hh`
  - `example/run_tpalg_taalg_tcalg.fcl`
- **Offline vs online TPs start\_time difference is solved [[link](#)]**

# Technicalities

- **Testing code:** `example/run_tpalg_taalg_tcalg.fcl`

```
tpmakerTPC:
{
  module_type: TriggerPrimitiveMakerTPC
  rawdigit_tag: "tpcrawdecoder:daq"
  tpalg: {
    tool_type: TPAlgTPCSimpleThreshold
    threshold_tpg_plane0: -1
    threshold_tpg_plane1: -1
    threshold_tpg_plane2: 60
    verbosity: 0
  }
  verbosity: 1
}
```

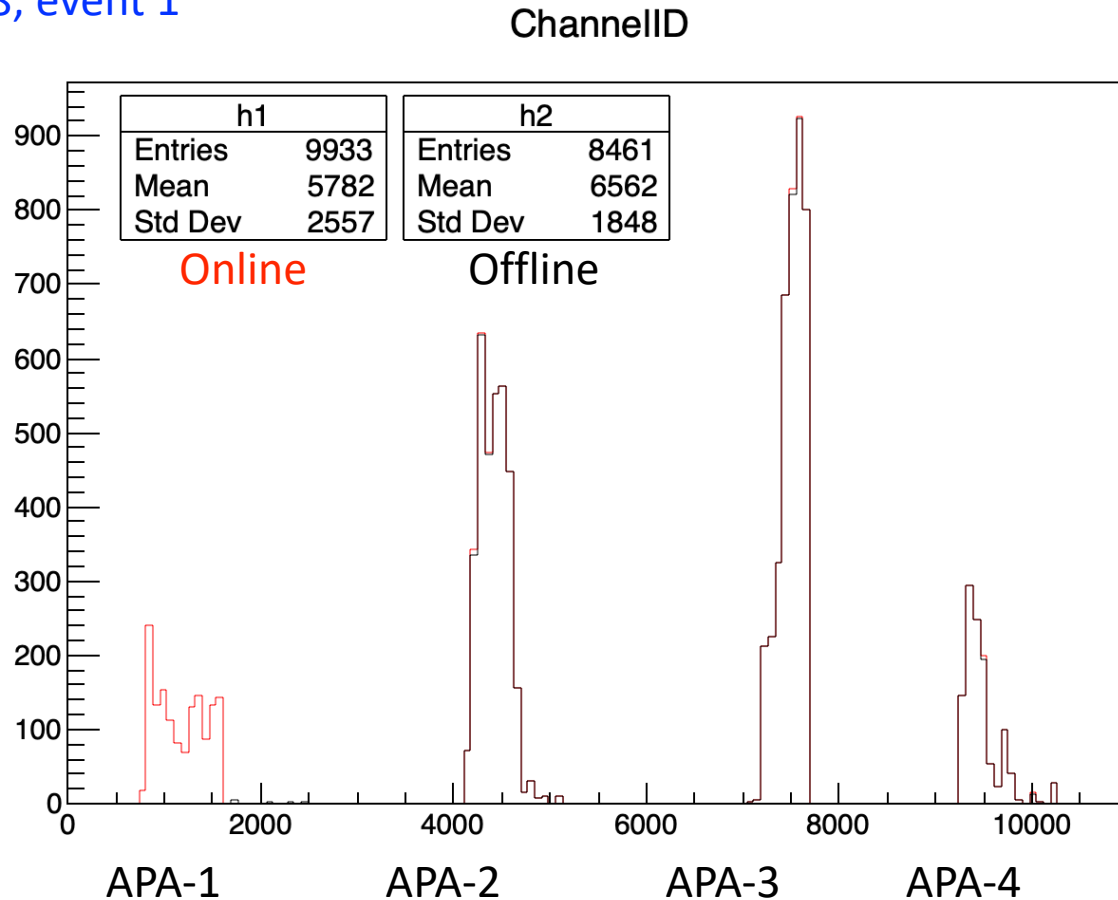
No TPs constructed if -1  
Only collection plane used for run028508



```
tamakerTPC:
{
  module_type: TriggerActivityMakerTPC
  tp_tag: "tpmakerTPC"
  taalg: {
    tool_type: TAAlgTPCADCSimpleWindow
    m_adc_threshold: 20000000
    m_window_length: 60000
    verbosity: 1
  }
  verbosity: 1
}
```

# Offline vs online performance: TP channel ID

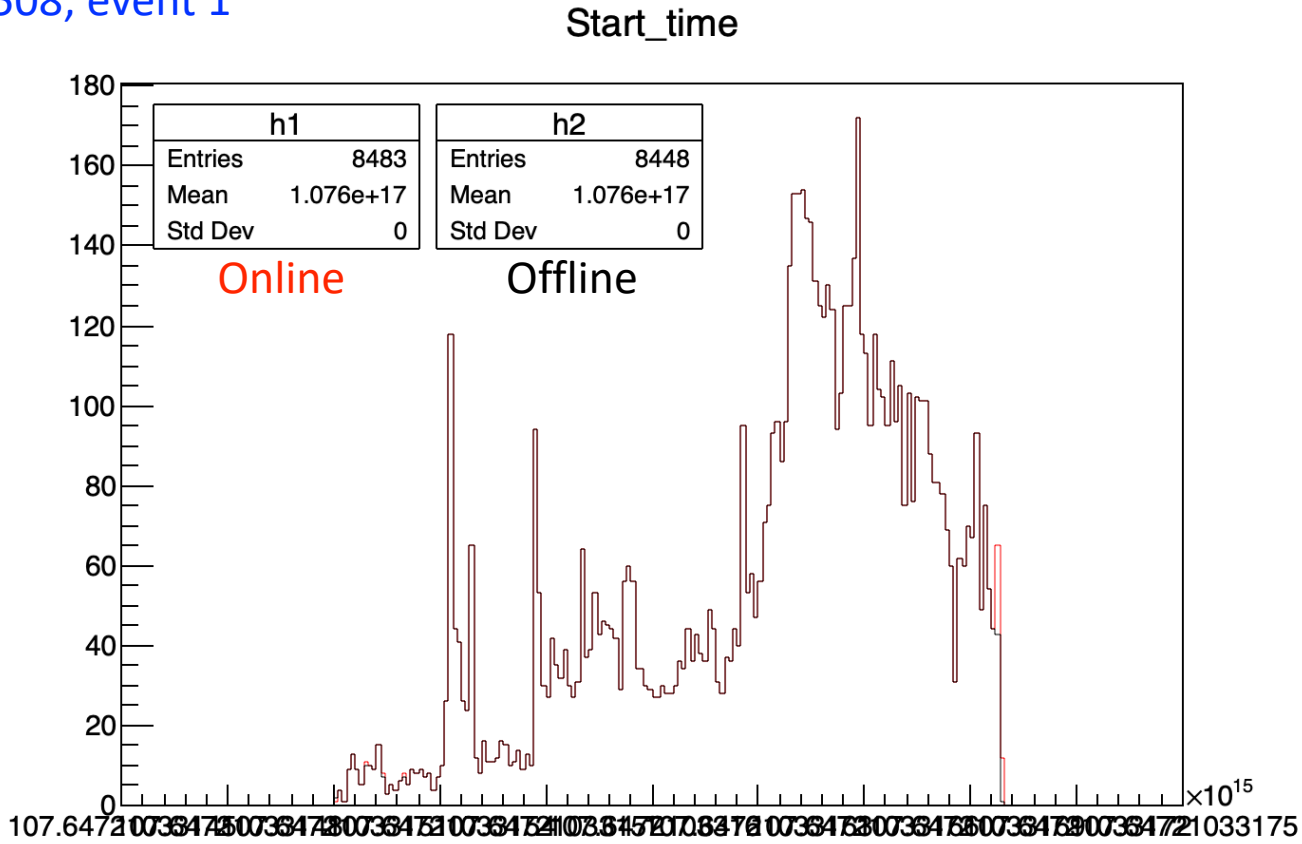
run028508; event 1



- **APA 2, 3 and 4 only:** 8448 TPs offline; **8483 TPs online**
- *All offline TPs match to online TPs*

# Offline vs online performance: TP start time

run028508; event 1



- **APA 2, 3 and 4 only:** 8448 TPs offline; **8483 TPs online**
- *All offline TPs match to online TPs*

# Offline vs online performance: TPs in a TA

run028508; event 1; TA 1

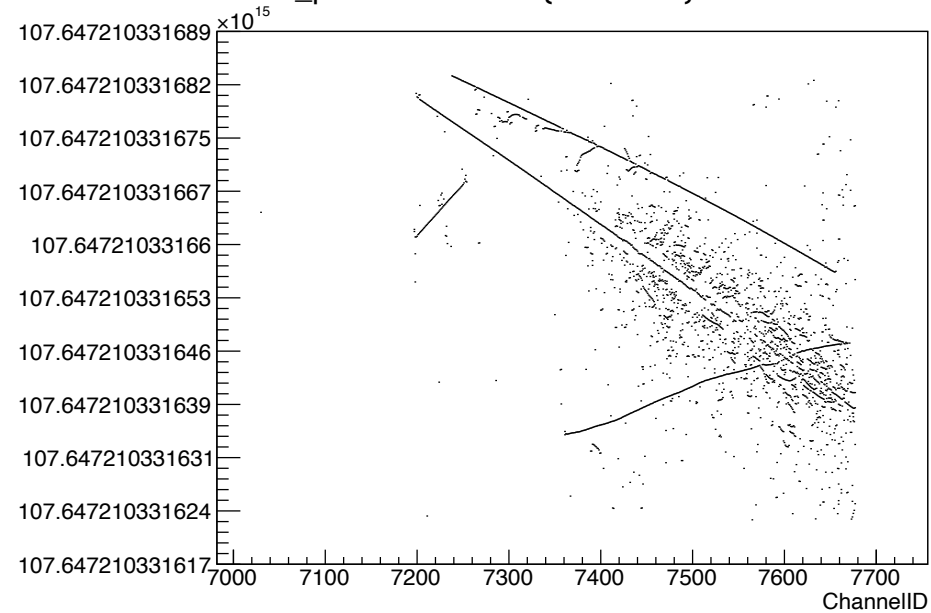
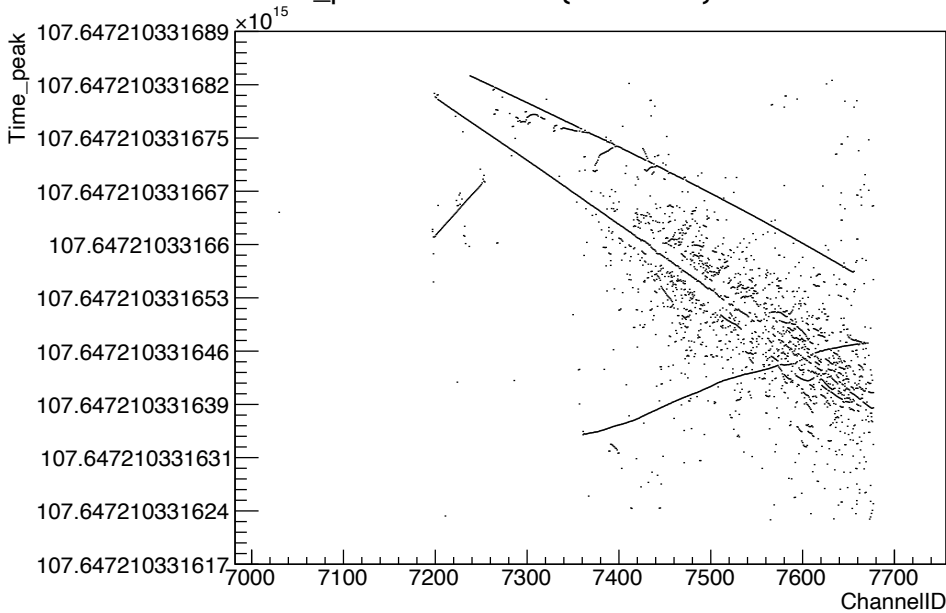
- Online: 3276 TPs
- Offline: 3276 TPs

Offline

Online

Time\_peak:ChannelID {Event==1}

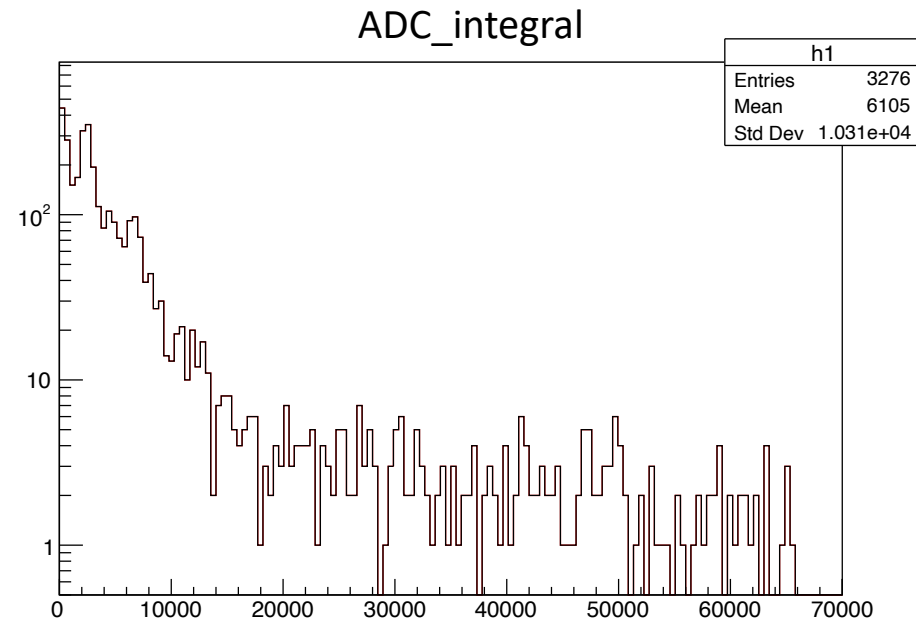
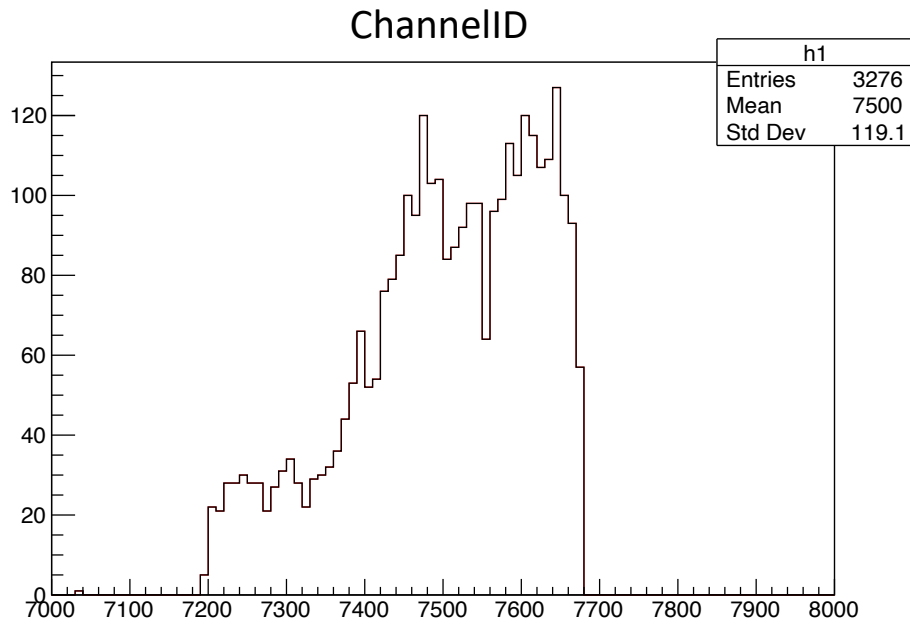
Time\_peak:ChannelID {Event==1}



# Offline vs online performance: TPs in a TA

run028508; event 1; TA 1

- Online: 3276 TPs
- Offline: 3276 TPs



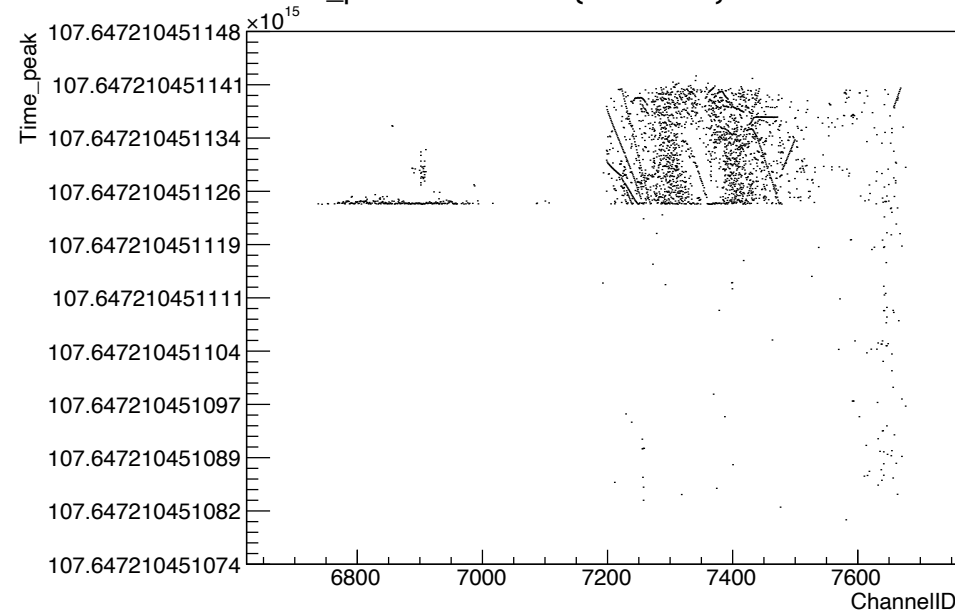
# Offline vs online performance: TPs in a TA

run028508; event 3; TA 1

- Online: 2706 TPs
- Offline: 2730 TPs

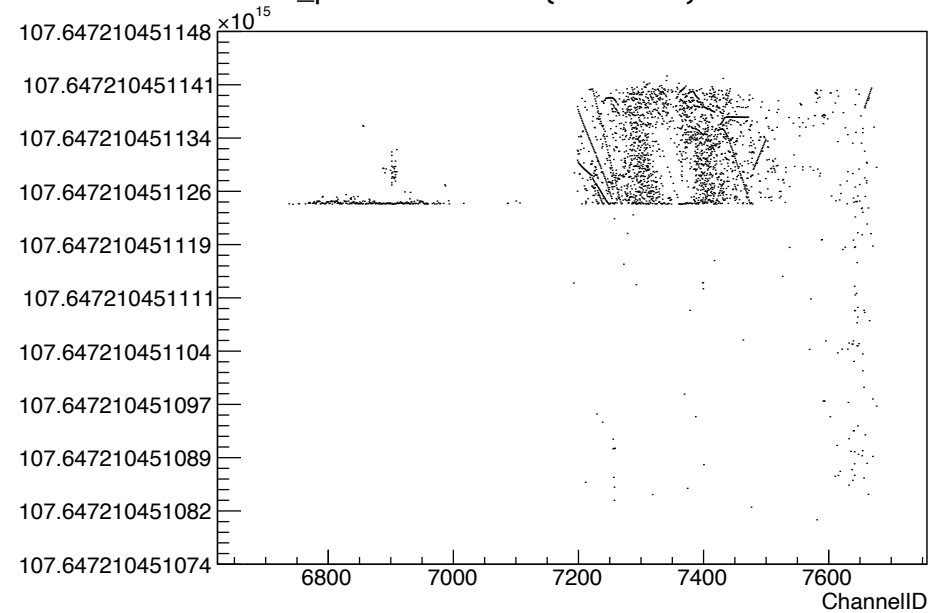
Offline

Time\_peak:ChannelID {Event==3}



Online

Time\_peak:ChannelID {Event==3}

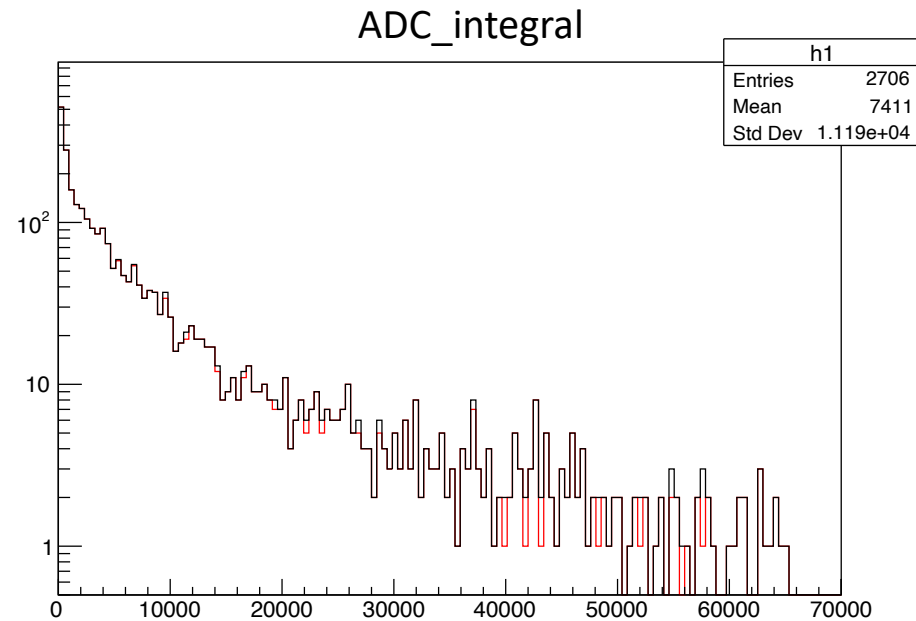
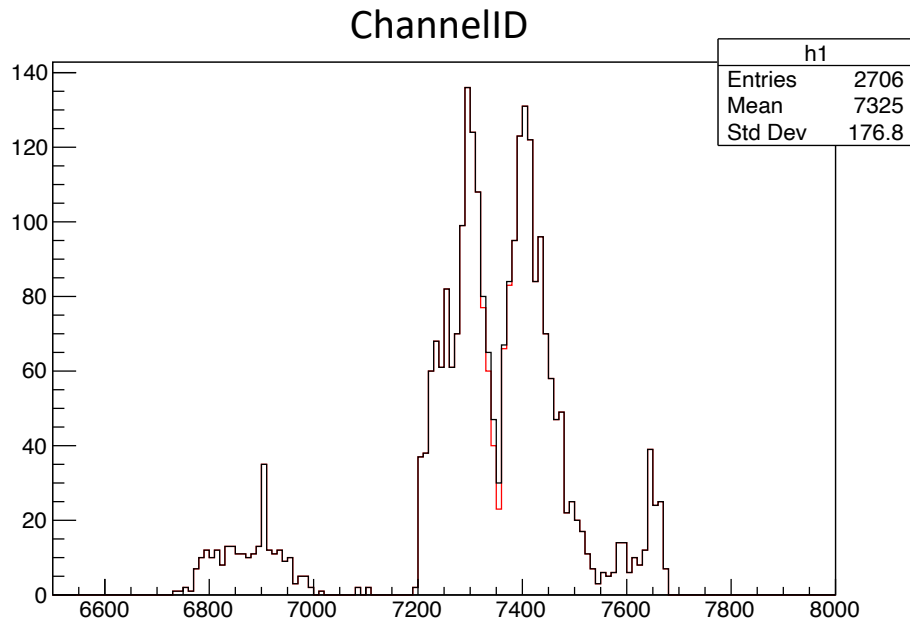




# Offline vs online performance: TPs in a TA

run028508; event 3; TA 1

- Online: 2706 TPs
- Offline: 2730 TPs



# Backup