

# Open Discussion: Event model options

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# Event model options

## **Option A:** **clustering/classification at TSP-level**

- SPE (TPC and Veto):
  - $Q, T, \Delta t$
- Low-multiplicity Multihit S1-like:
  - $Q, t, \Delta t, \{\text{prominences}\}$
- High-multiplicity S2-like:
  - $N$  Waveforms around max
  - $Q, t, \Delta t$  for decimated hits
- Veto: Multihit corresponding to TPC events (time cut)

## **Option B:** **hit finder and compression**

- Multihit: Prominence,  $T, Q$
- S2-like: multihit decimation

# Event model options

## Option A event-like

- SPE: 10 Bytes
- Low-multiplicity Multihit S1-like:  
ch:2B + Q:4B + t:2B +  $\Delta t$ :2B +  
Nk:2NB + flag:1B = 31B  
assuming multiplicity N=10
- High-multiplicity S2-like:  
ch:2B + t:2B + wf:200NB +  
flag:1B + summary:10B = 2015B  
assuming N=10 and 100 samples
- Veto: 10 Bytes

## Option B per channel per hit

- Multihit: Prominence, T, Q
- S2-like: multihit decimation

$$\text{ch:2B} + N \times \{ \text{t:2B} + \text{k:2B} + \text{Q:4B} \}$$

where N is the channel occupancy

# Event model options

## **Option A:**

- Benefits: specification of the algorithms for S1/S2 allows optimization of written data.
- Drawbacks: Reprocessing is complicated

## **Option B**

- Benefits: simplicity, lots of options
- Drawback: searches are complex because data are not sorted

# Questions

- Calibrations data: do they fit in any of these models?
  - Which data are necessary?
- Searches: which quantities are useful for which search?
  - Is an optimization possible?

# DS-20k Data Processing Glossary

**Fragment:** data (waveform) collected by each WFD.

**Segment:** fully assembled data collected over a time period from the whole detector.

**Time Slice:** same as “segment”.

**Hit:** channel with a signal  $\geq 1$ PE, it could be DC, CT or part of a pulse.

**Cluster:** group of hits with common features, e.g., they are a pulse.

**Pulse:** physical signal of type S1 or S2.

**Event:** particle interaction with the detector with an S1 pulse and an S2 pulse