



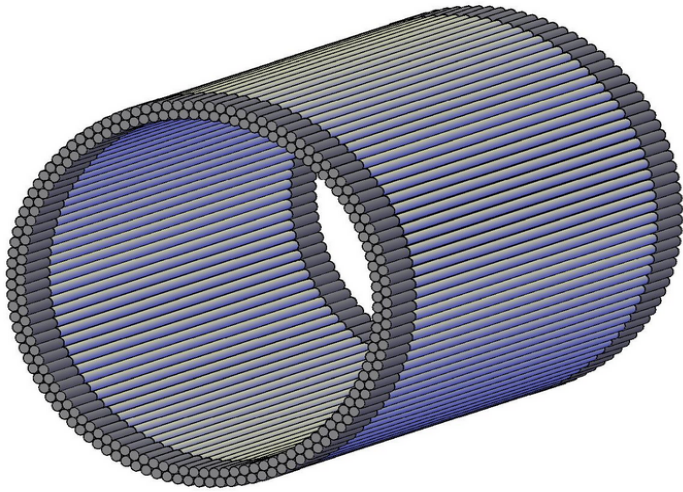
JAGIELLONIAN UNIVERSITY
IN KRAKOW

J-PET data base and data structure

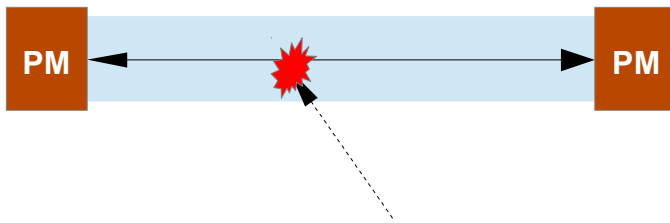
Eryk Czerwiński, Marcin Zieliński

Symposium on Positron Emission Tomography
Cracow, 21.09.2013

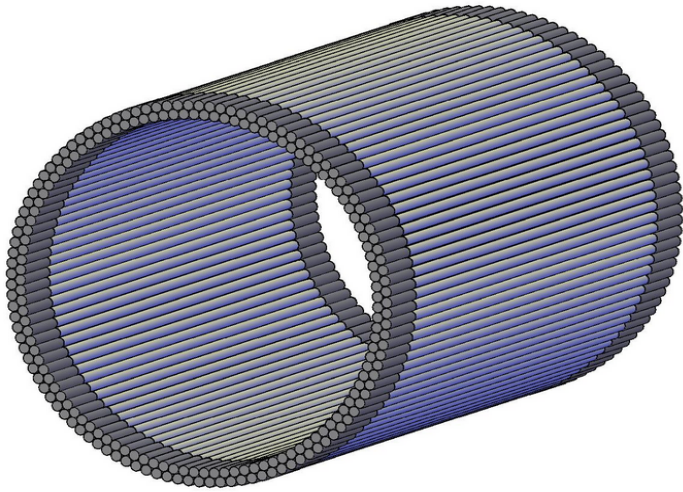
Why do we need a data base (DB)?



- expected data rate 15 MB/s (~100TB/year)
- event by event: only measurement of time



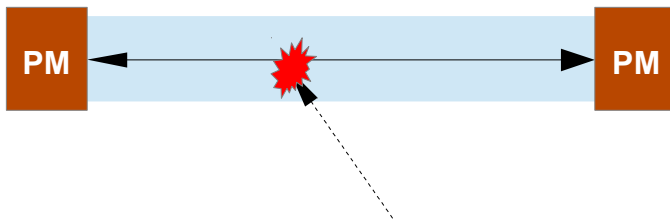
Why do we need a data base (DB)?



- expected data rate 15 MB/s (~100TB/year)
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but

- setup and configuration are (almost) the same
- calibration *constants* are (almost) unchanged
- information about date of measurement and data file location



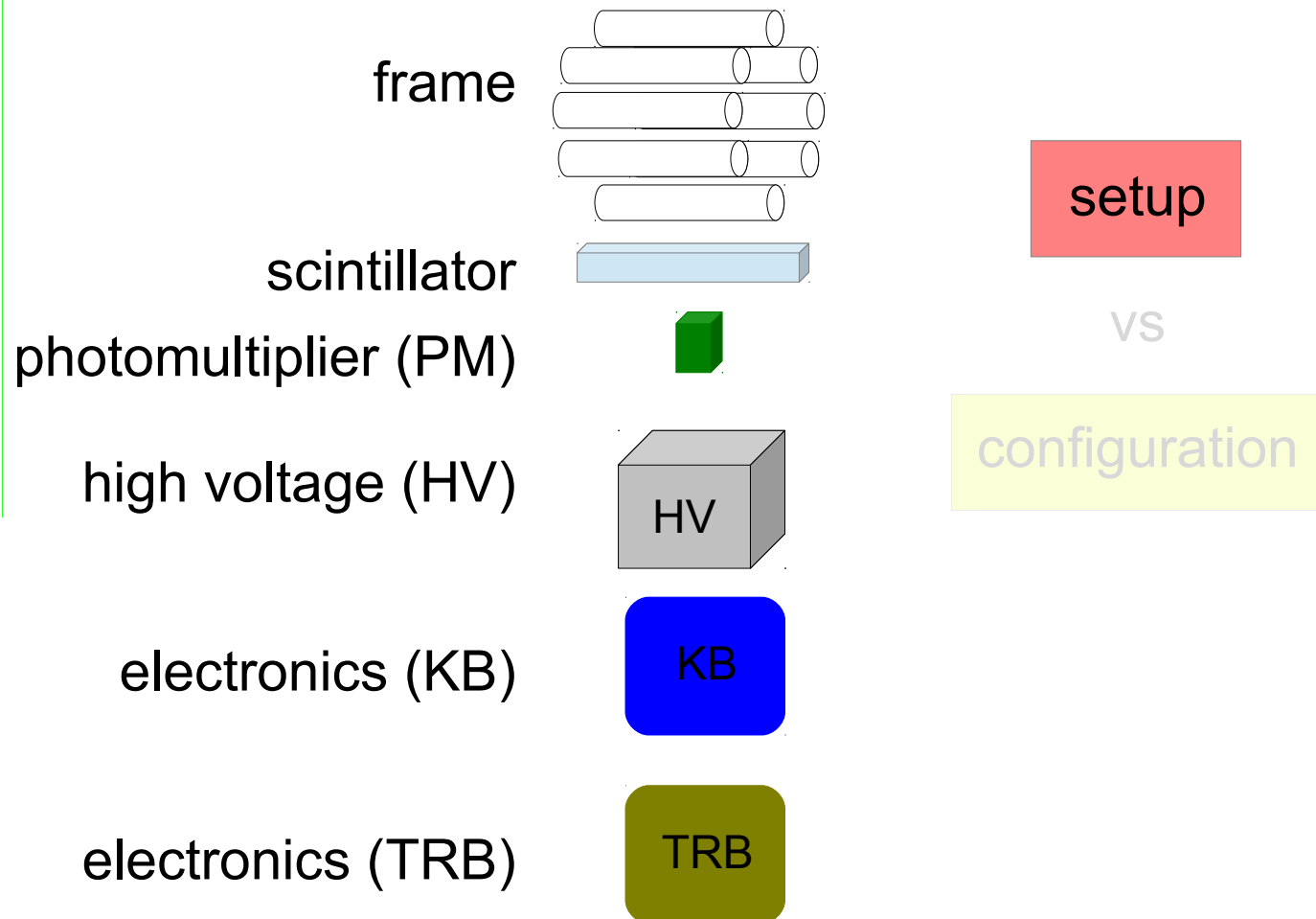
General view of J-PET DB: setup vs config

setup

vs

configuration

General view of J-PET DB: setup



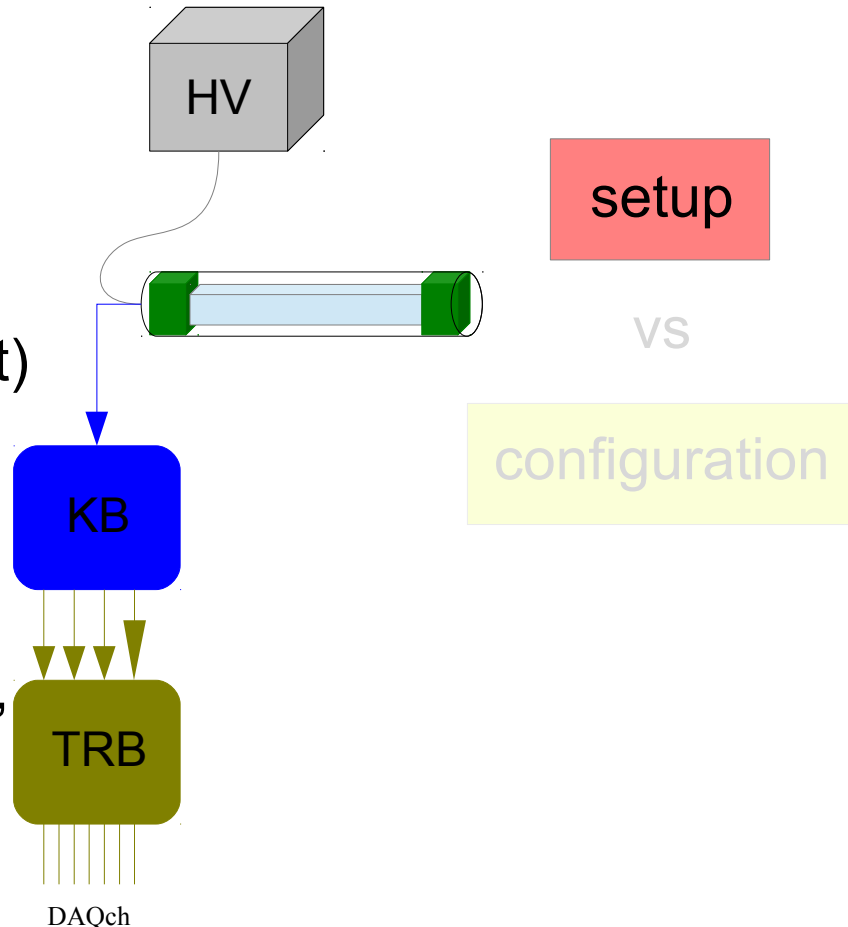
General view of J-PET DB: setup

HV crate ID,
channel ID

scintillator ID,
position (x,y,z),
PM ID (left and right)

KB ID, channel ID,
channel type

TRB ID, channel ID,
channel type,
DAQ channel ID



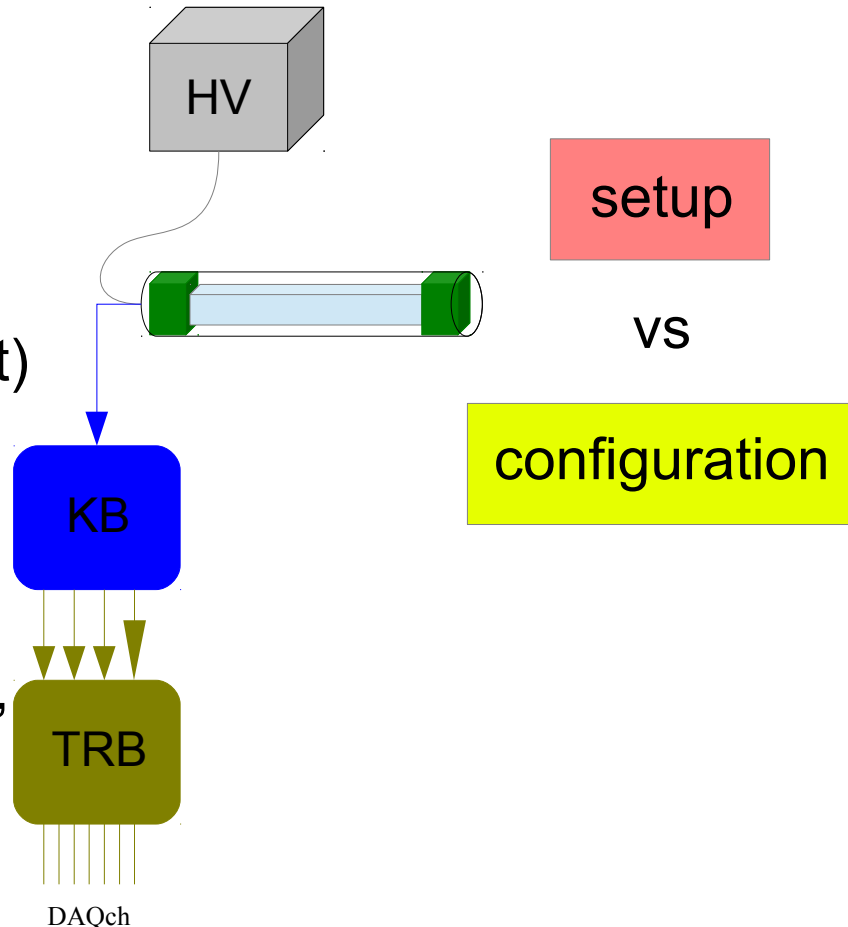
General view of J-PET DB: configuration

HV crate ID,
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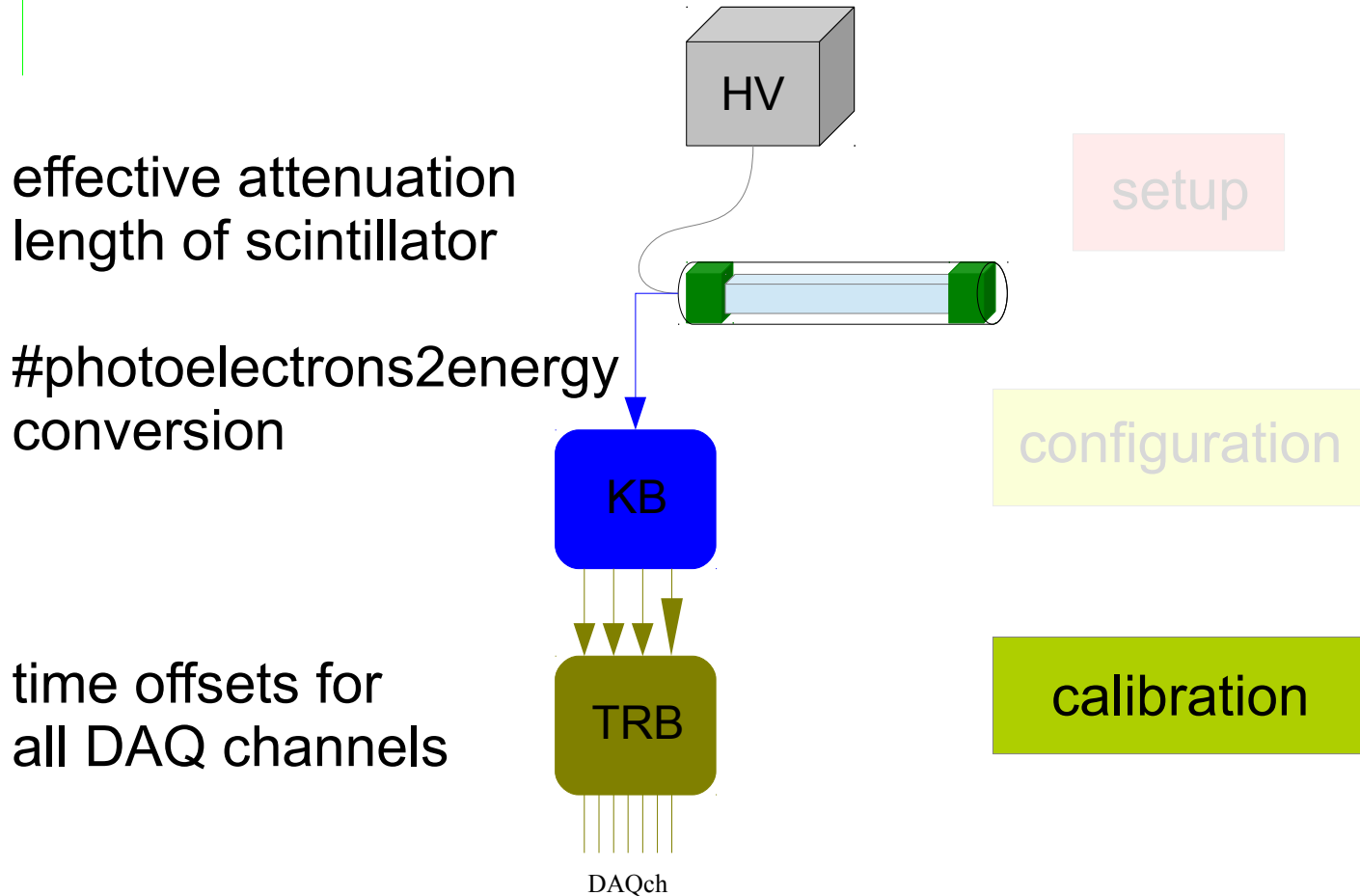


HV values used
(and optimal)

thresholds used
(and optimal)

thresholds used
(and optimal)

General view of J-PET DB: calibration



General view of J-PET DB

connections between elements

setup

settings

configuration

properties of elements

calibration

General view of J-PET DB

connections between elements

setup

only manual changes
(hands on the hardware)

settings

configuration

software changes

properties of elements

calibration

independent

General view of J-PET DB: hardware

connections between elements

setup

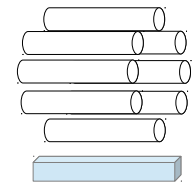
settings

configuration

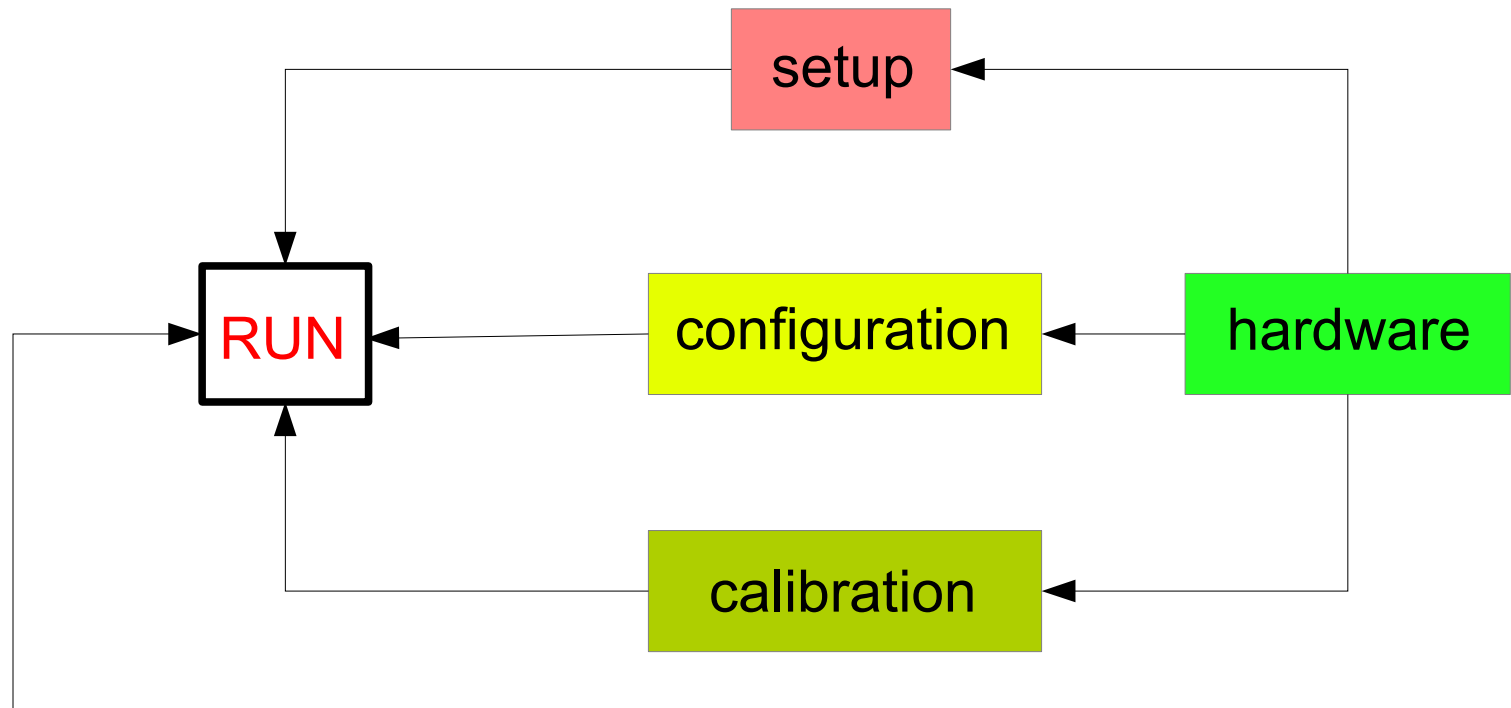
hardware

properties of elements

calibration



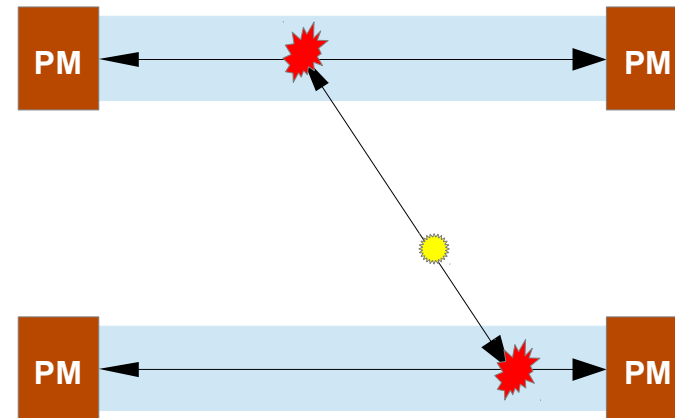
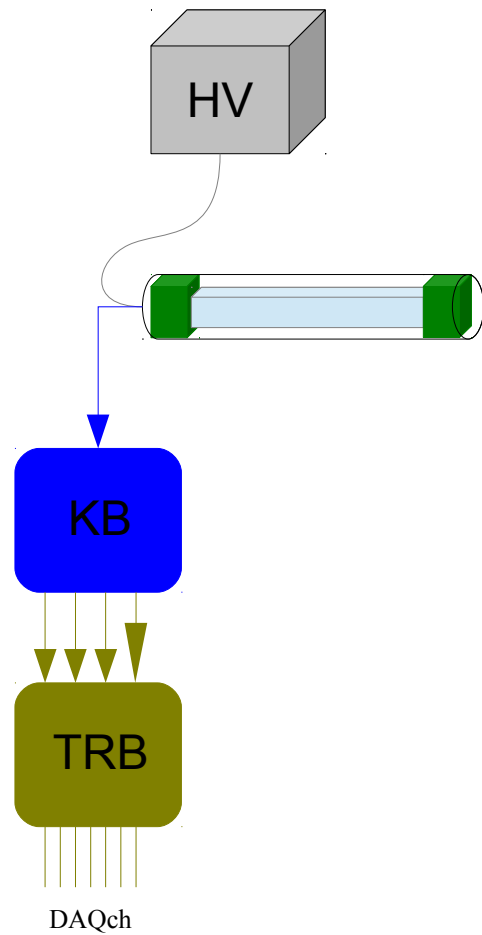
General view of J-PET DB: run



+ start/stop date and time
+ data file location

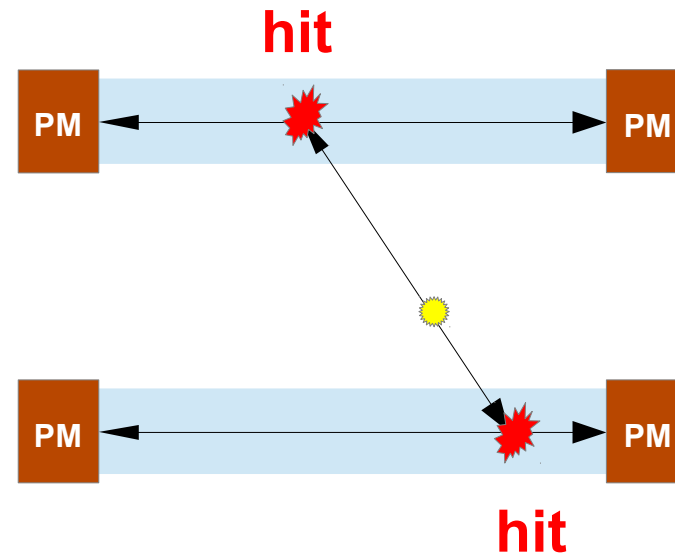
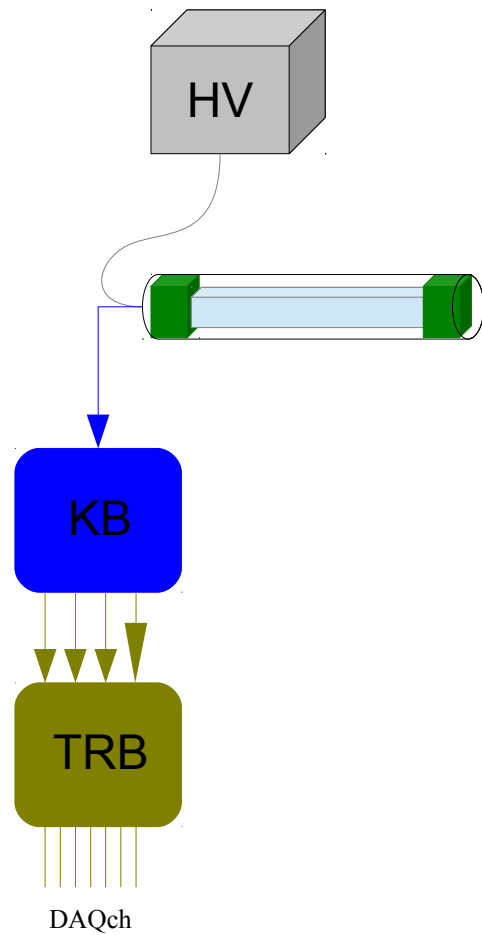
Time definition

event by event: only measurement of time



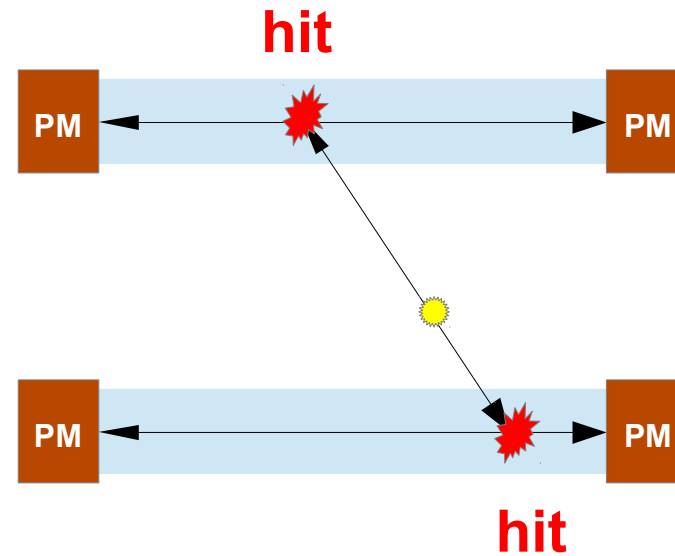
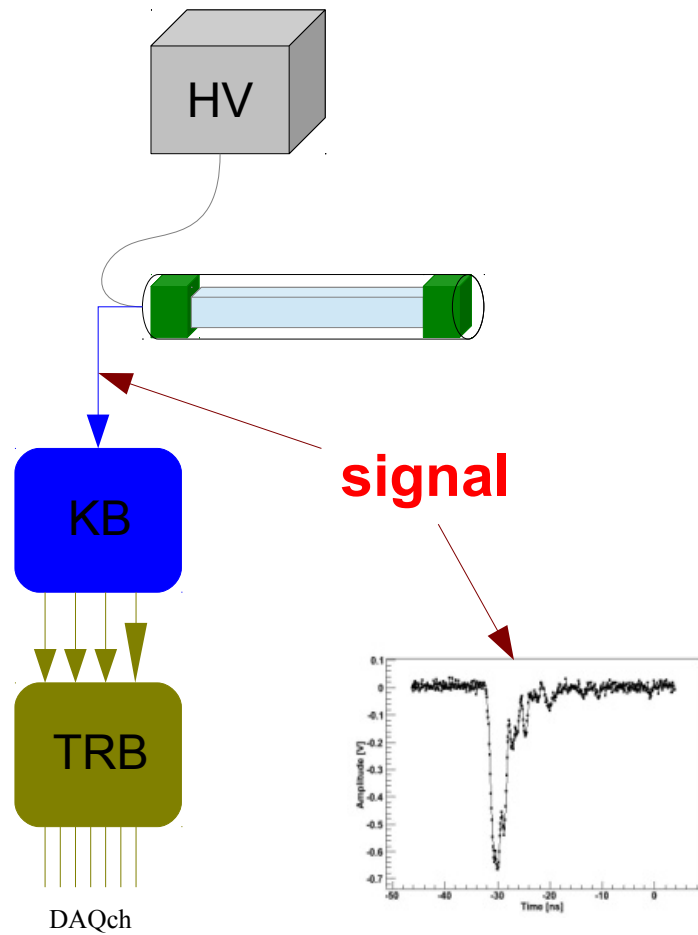
Time definition

event by event: only measurement of time



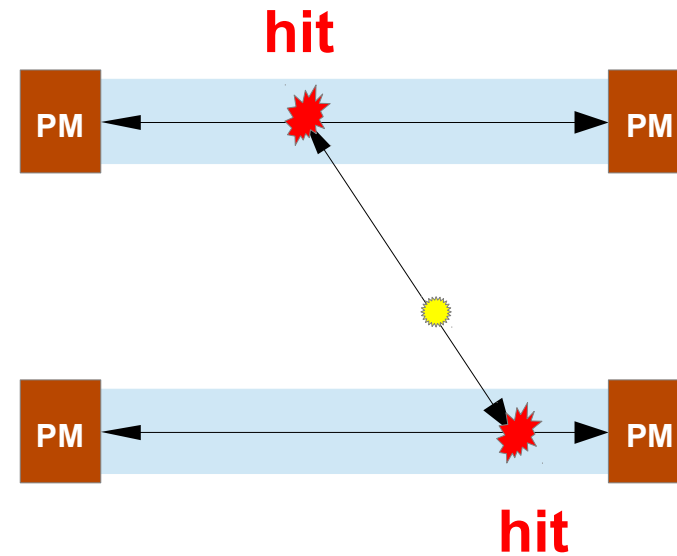
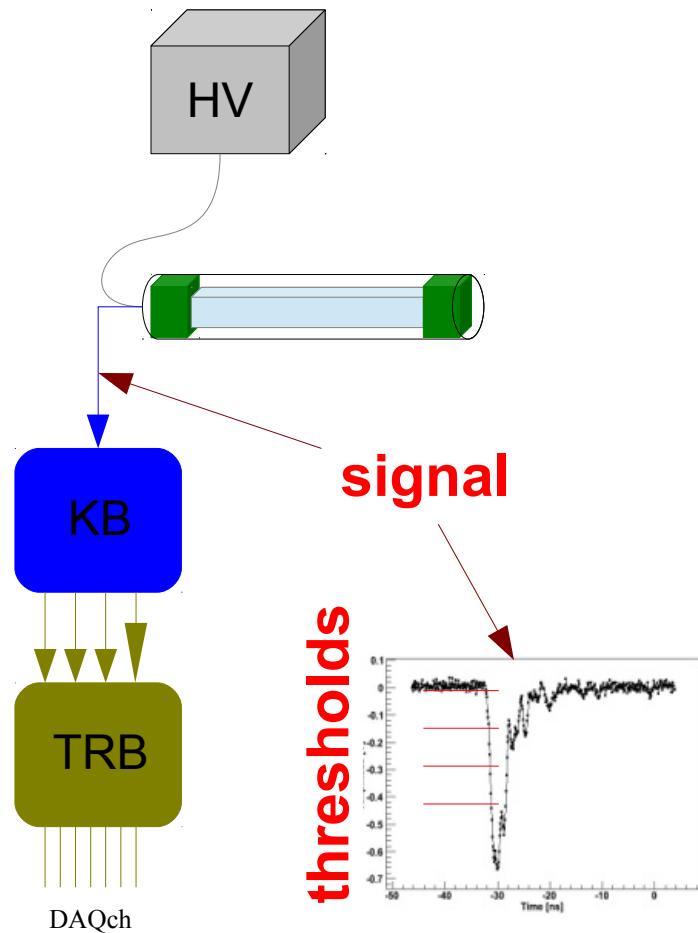
Time definition

event by event: only measurement of time



Time definition

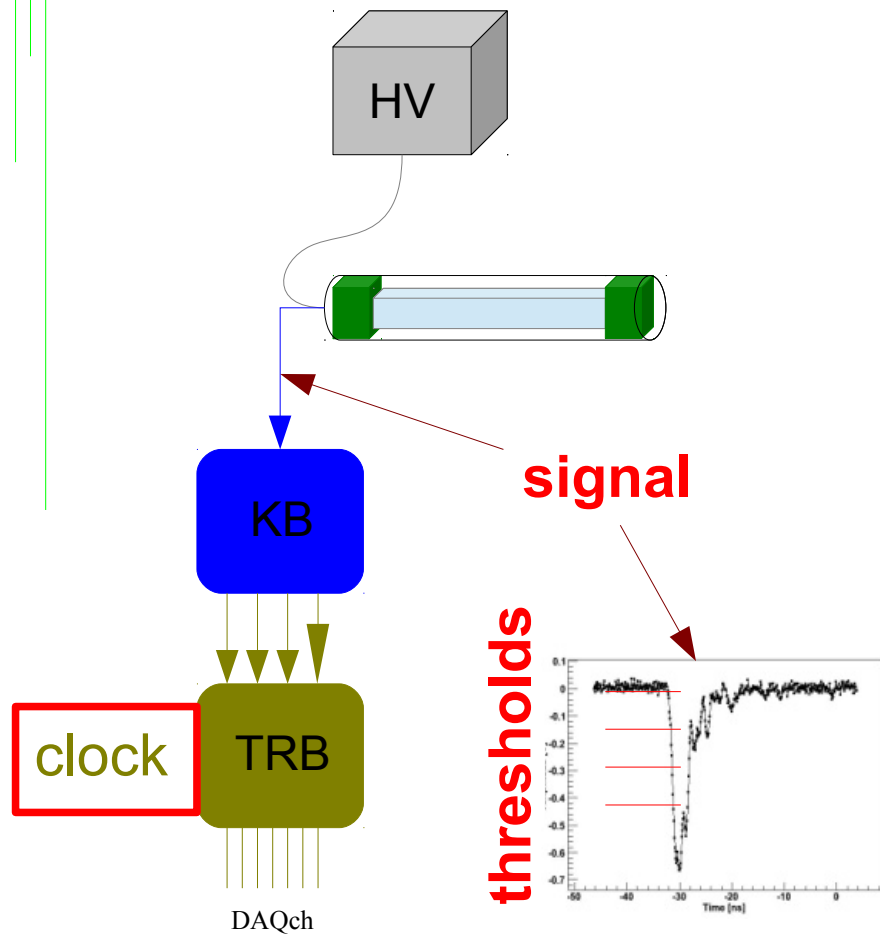
event by event: only measurement of time



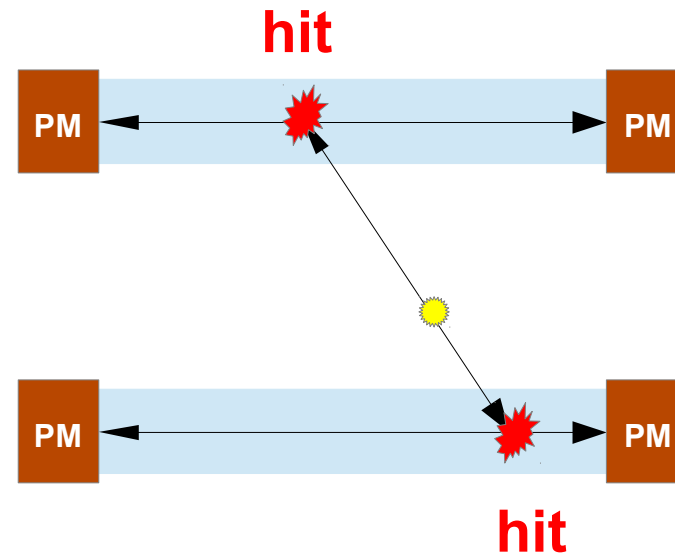
channel-signals

Time definition

event by event: only measurement of time



channel-signals

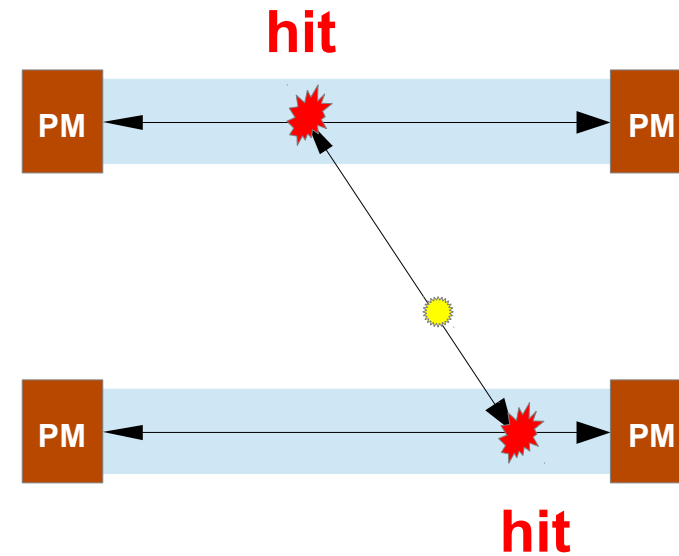
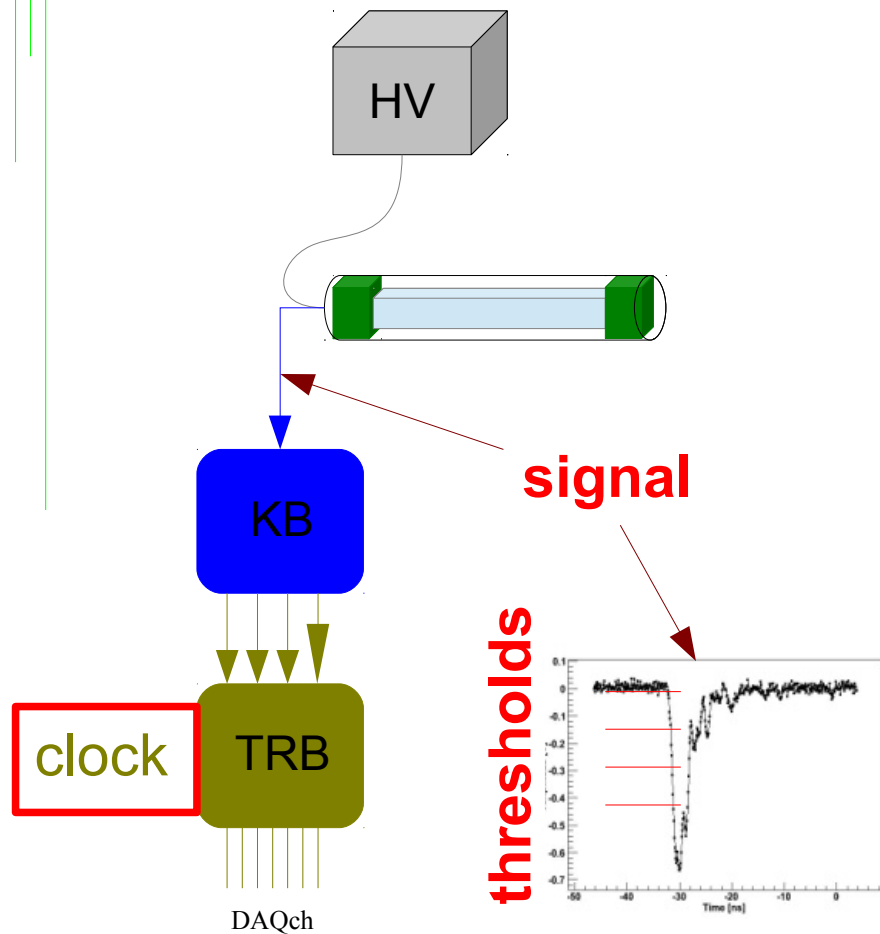


stop: arrival time of the channel-signal

start: **clock** (tslot)
channel-signals can be spread among different tslots

Time definition

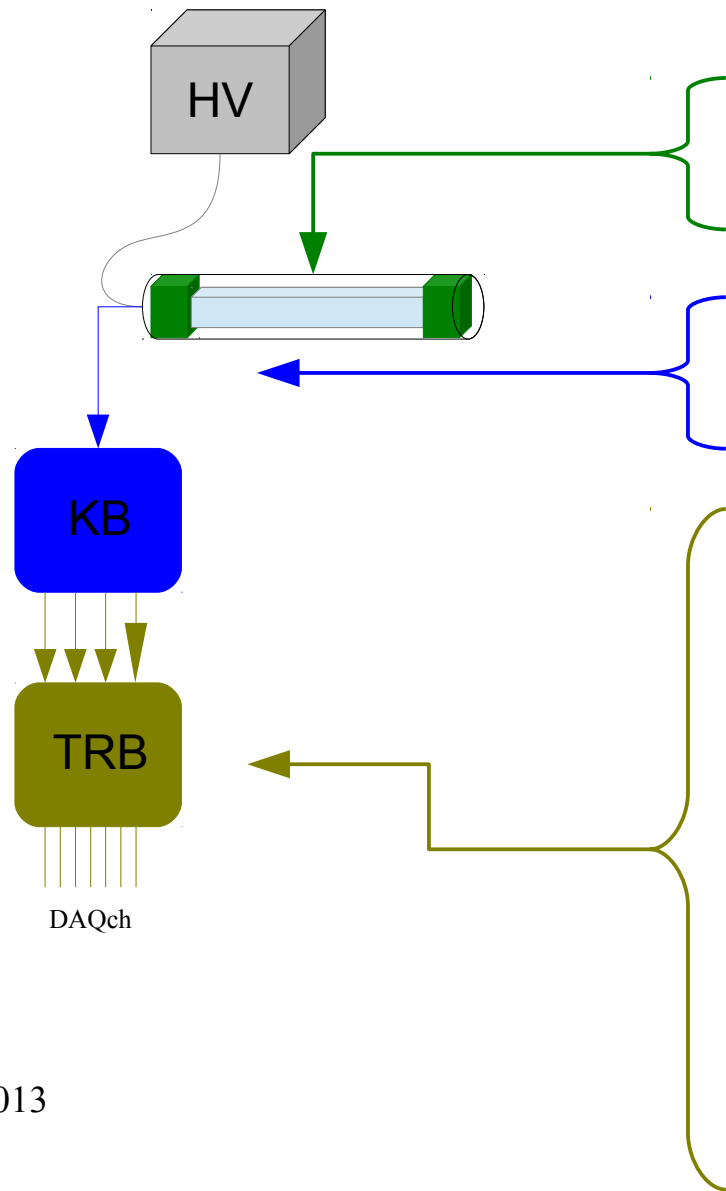
event by event: only measurement of time



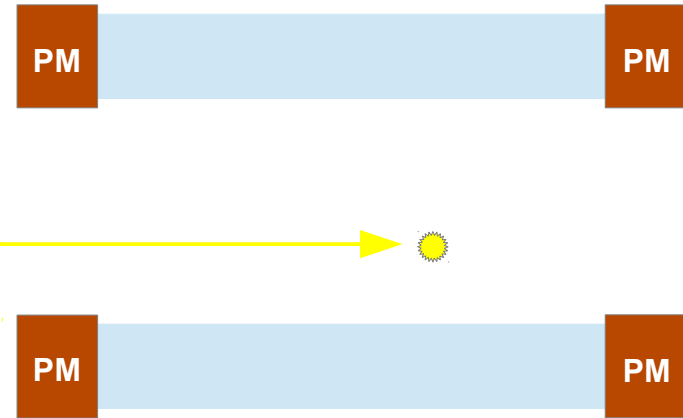
channel-signals

1 event = 2 hits
1 hit = 2 signals
1 signal = (N+1) channel-signals

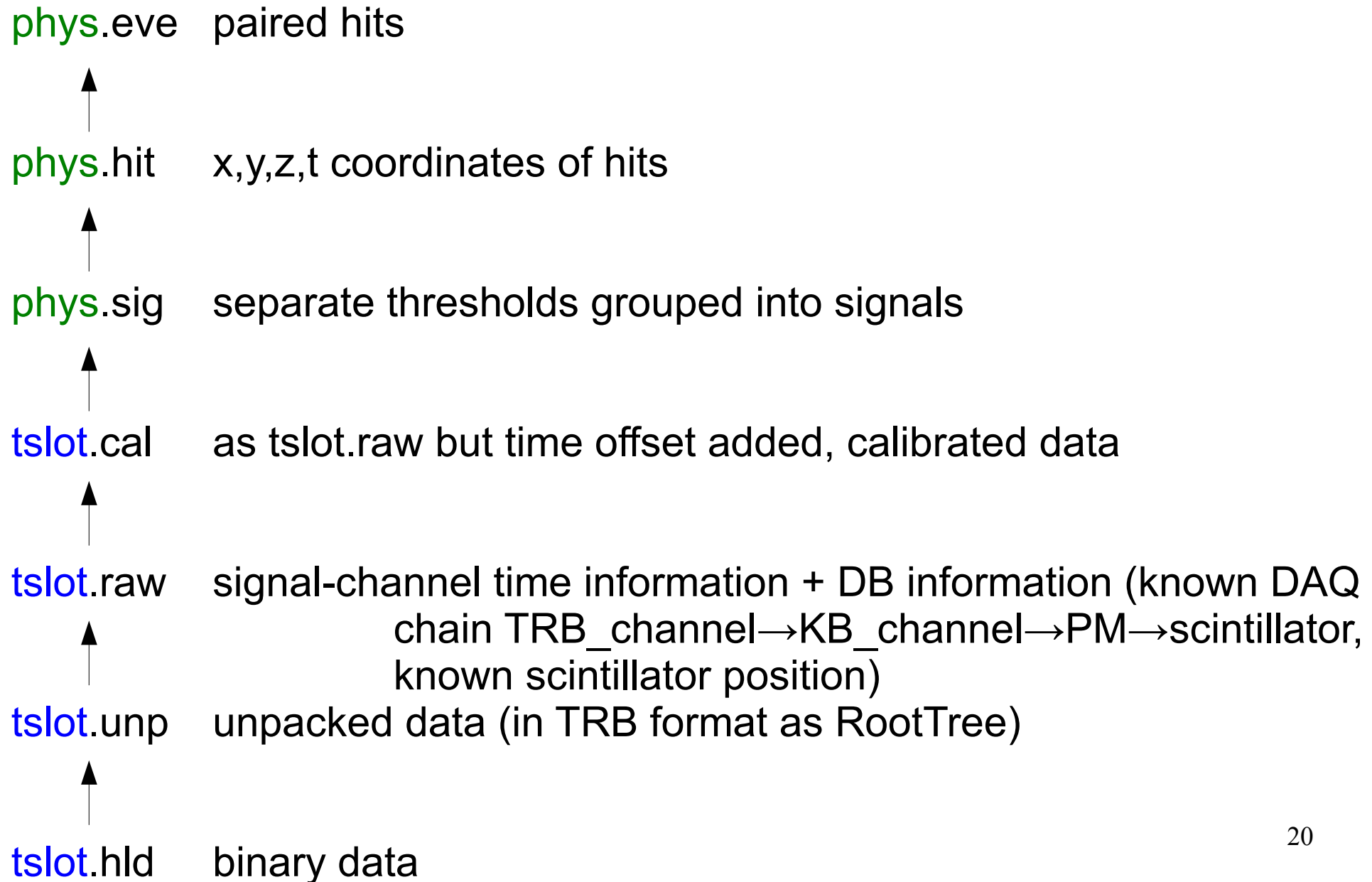
Data structure



phys.eve
↑
phys.hit
↑
phys.sig
↑
tslot.cal
↑
tslot.raw
↑
tslot.unp
↑
tslot.hld



Data structure



Summary

J-PET data structure reflects both physical process and used DAQ system.

Information stored in a DB decreases total data flow and allows for better setup control during development stage.

Thank you for your attention.