KLM Trigger

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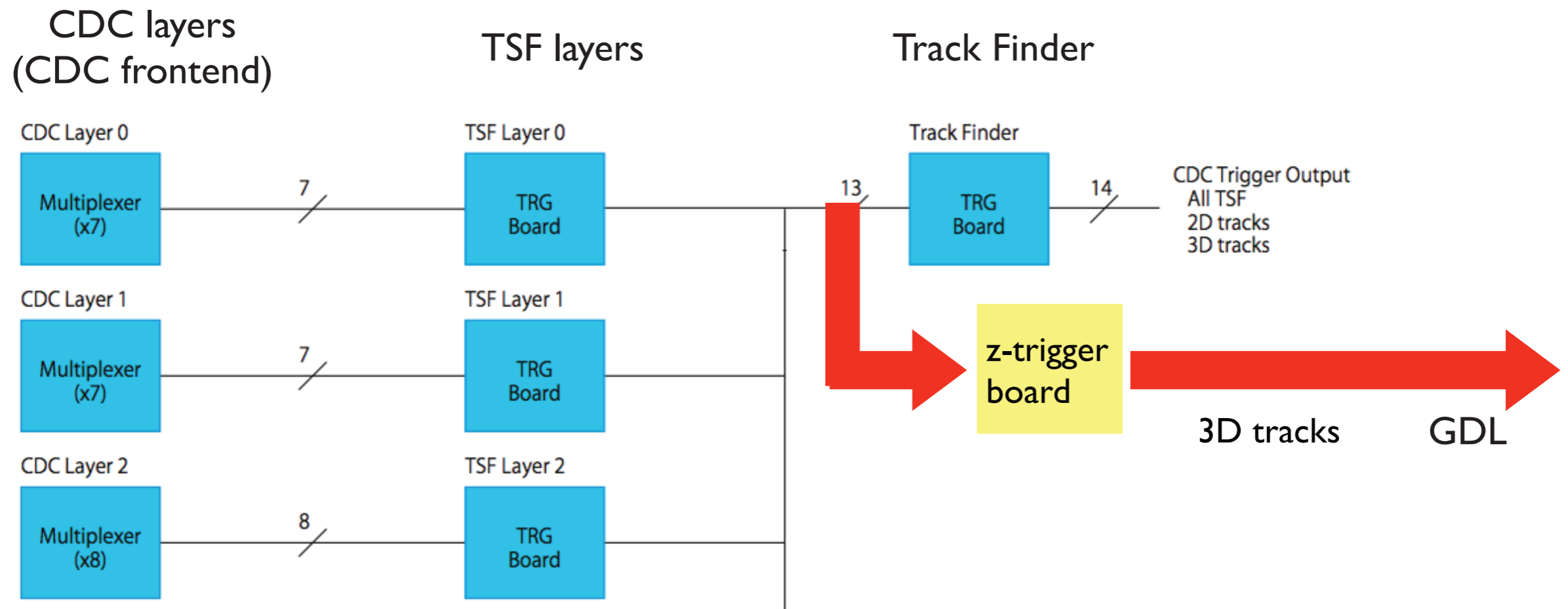# Belle Level-1 KLM triggers looks for evidence of muons

- Forward endcap = AND of layers 4 and 5 (for each of the four phi-sectors)

- Backward endcap = *[same]*

- Barrel: ANY TWO of layers 2, 3, 10, and 11 (for each of the eight phi-sectors)

Simple geometry, somewhat polluted by cosmic rays

bit	delay	mnemonic	description
40	62	klm_fwd	KLM forward endcap trigger
41	62	klm_bwd	KLM backward endcap trigger
42	62	klm_brl	KLM barrel trigger
43	6	svd_tofcdc	for SVD L0 study
44	12	nsvdz_full0	first bit of the number of SVD Z full tracks
45	12	nsvdz_full1	second bit of the number of SVD Z full tracks
46	12	nsvdr_full0	first bit of the number of SVD R-ϕ full tracks
47	12	nsvdr_full1	second bit of the number of SVD R-ϕ full tracks

¶ SuperBelle Level-1 KLM trigger would look for evidence of muon **tracks**

- Same design philosophy as advocated by Eunil Won for CDC 3D track trigger (based on FPGA track finding)
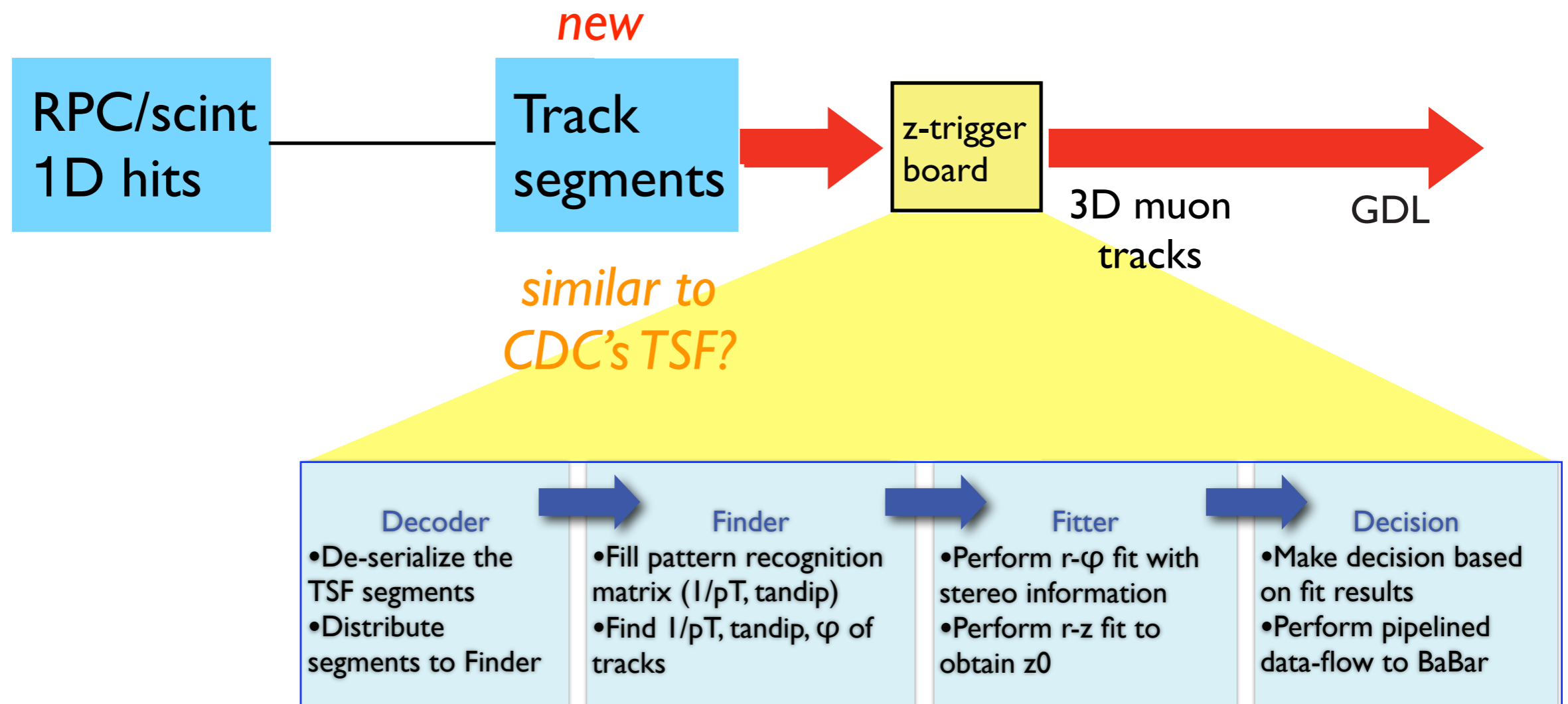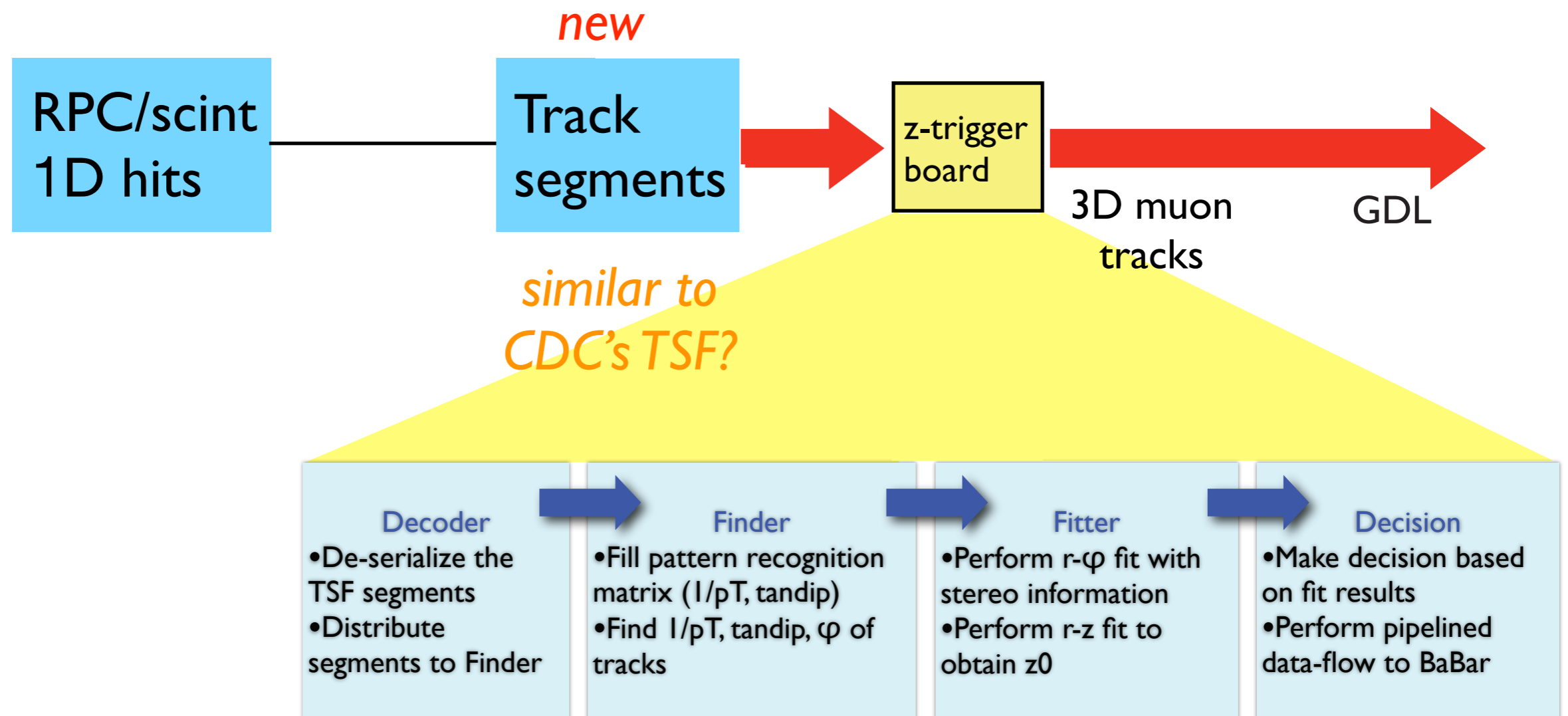
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new

| RPC/scint 1D hits | — | Track segments | → | z-trigger board | → | GDL |

3D muon tracks

similar to CDC's TSF?

Decoder
- De-serialize the TSF segments
- Distribute segments to Finder

Finder
- Fill pattern recognition matrix (1/pT, tandip)
- Find 1/pT, tandip, φ of tracks

Fitter
- Perform r-φ fit with stereo information
- Perform r-z fit to obtain z0

Decision
- Make decision based on fit results
- Perform pipelined data-flow to BaBar

¶ SuperBelle Level-1 KLM trigger would look for evidence of muon **tracks**

- Requires new track-segment finder

- Same z-trigger board as for CDC-3D track finder, but requires KLM-specific FPGA programming

new

RPC/scint 1D hits	Track segments	z-trigger board

3D muon tracks   GDL

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¶ SuperBelle Level-1 KLM trigger would look for evidence of muon tracks

- Output to GDL: # of 3D muon tracks in forward endcap, in backward endcap, in barrel, and in KLM
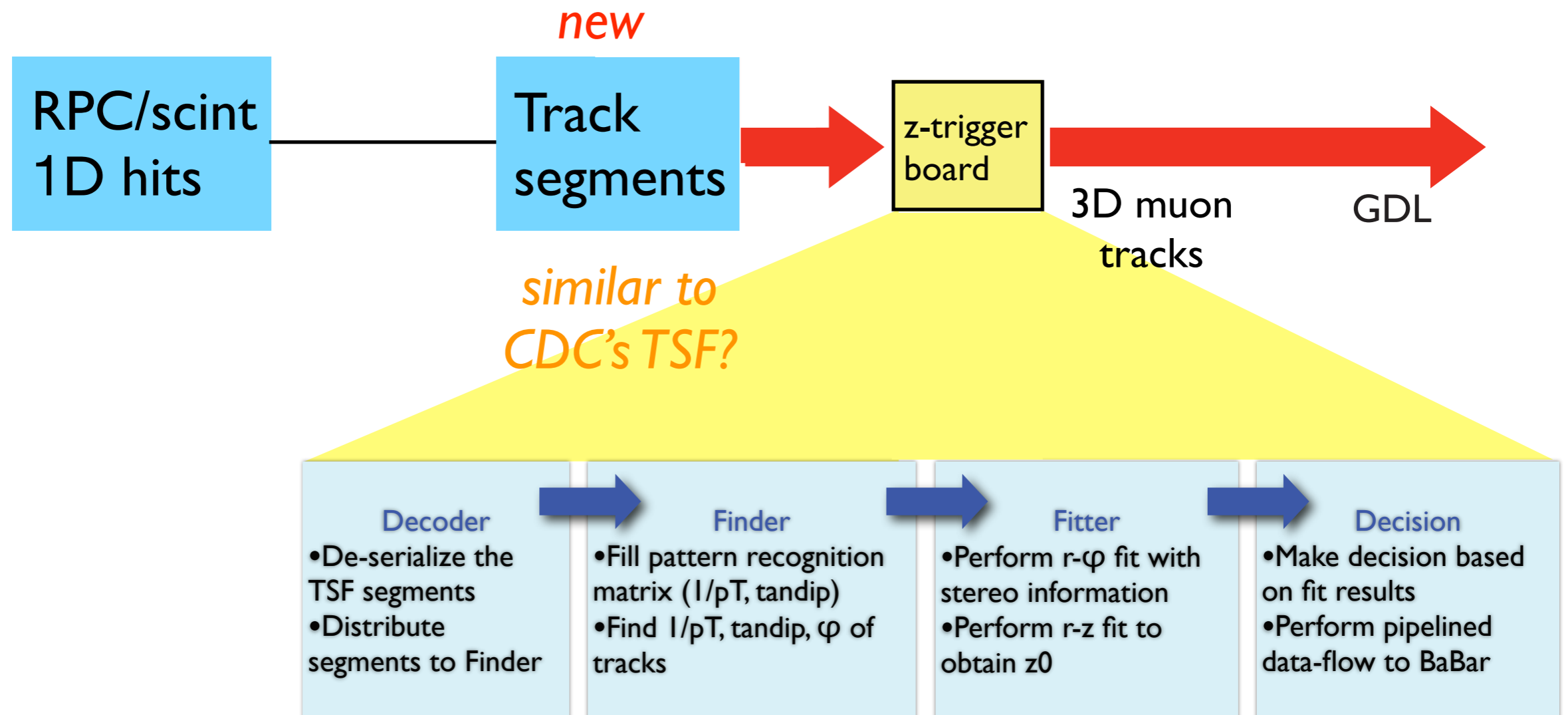
tsim-klm

- No work done on this yet

- If new KLM trigger is adopted, modify existing tsim-klm to duplicate its geometrical functionality

- tick-by-tick: not needed for tsim-klm (?)