

# New Package l1ft2b: For RunIIb CFT L1 Tracking Trigger Studies

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Outline:

- Intro to l1ft2b
- Status
- Test
- Conclusion & Next

# Introduction

Aim: provide a simple to use and publicly available framework, for studies of different L1CFT schemes for defining CFT “hits” and “tracks”.

- Inputs: d0sim output
- read CFT hit fibers from SFTDigiChunk
- Convert hit fibers to L1CFT cluster with different schemes(Singlet/Doublet)
- Read in preprogrammed equations
- Compare equations with L1CFT cluster → trigger tracks
- Outputs: ROOT file containing:
  - L1CFT: information on found trigger tracks, e.g., ptmin/ptmax, icftxN, etc
  - MCTRK: information on all Monte Carlo stable charged particles, eg pt, phi, eta and vertex etc

# Status

1. Basic infrastructure implemented
2. Two specific schemes implemented for “hit” and “track” definition:
  - 8-Doublet Scheme: the same as `tsim_l1ft` L1CFT cluster
  - Singlet Scheme: Yuri’s “singlet” algorithm as per `run2b` proposal

## Test 1. Doublet Scheme:

- Sample: 4k single muons without minibias  
( $p_t = 12, 15, 20, 30, 40, 50$ )
- Result:

`l1ft2b` Doublet == `tsim_l1ft`

## Test 2. Singlet Scheme:

- Sample: single muons  $p_t = 12$  in mb5
- Result:

	Doublet Scheme	Singlet Scheme ( $\geq 12$ of 16)
# matched $p_t > 10$	1199	1046
# matched $5 < p_t < 10$	37	4
# fakes $p_t > 10$	91	10
# fakes $5 < p_t < 10$	206	21

Table 1: **Given by Run2b document: total events 1300**

	Doublet Scheme	Singlet Scheme ( $\geq 12$ of 16)
# matched $p_t > 10$	1170	1088
# matched $5 < p_t < 10$	197	10
# fakes $p_t > 10$	86	3
# fakes $5 < p_t < 10$	116	4

Table 2: **Given by 11ft2b: total events 1416**

- Some clear discrepancies need to be understood.
- We could use Yuri's help in trying to do this!

## Next steps

- Release into CVS (imminent)
- Implement “real” 16-Singlet equations:  
(waiting for Graham Wilson to calculate equations)
- Think about other schemes