Simulation of hits reconstruction for the UT tracker for modernised LHCb detector

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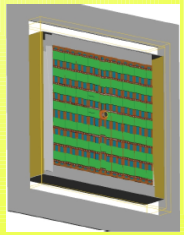
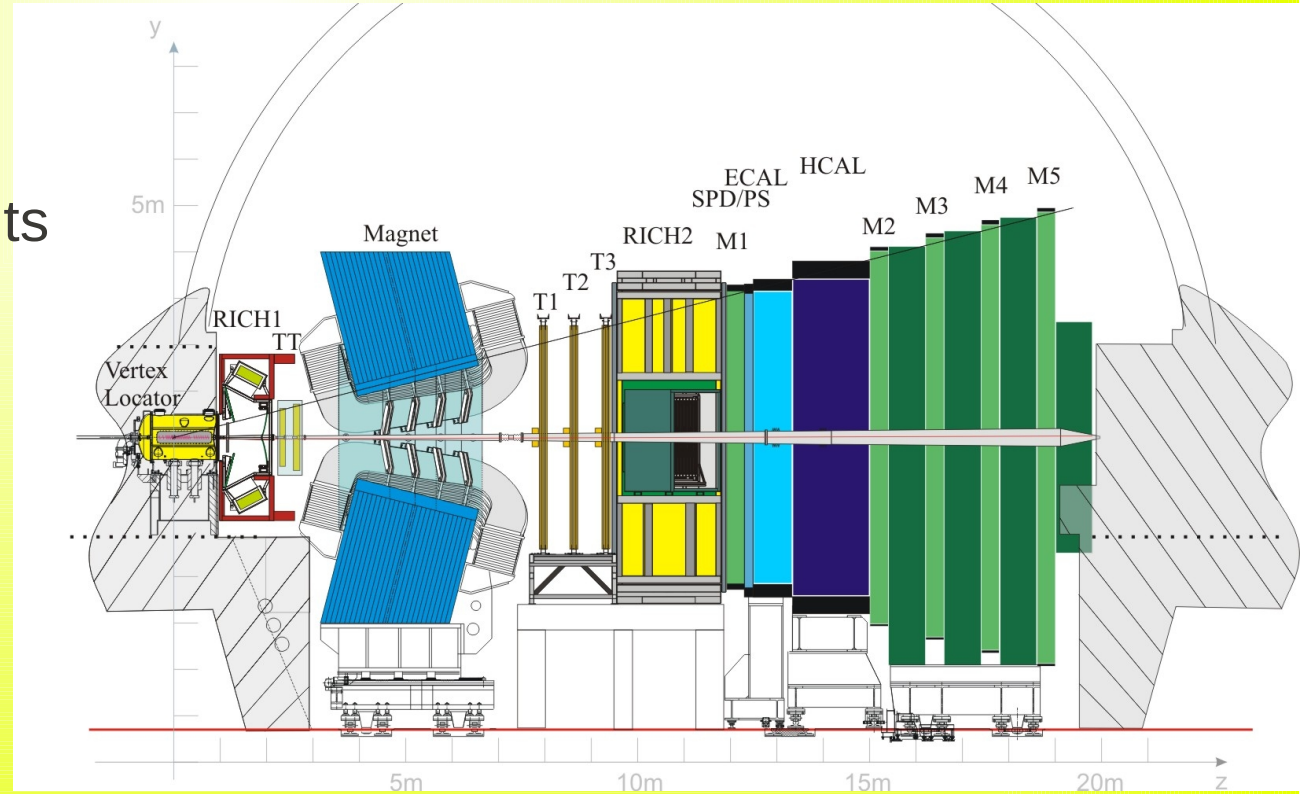


Outline:

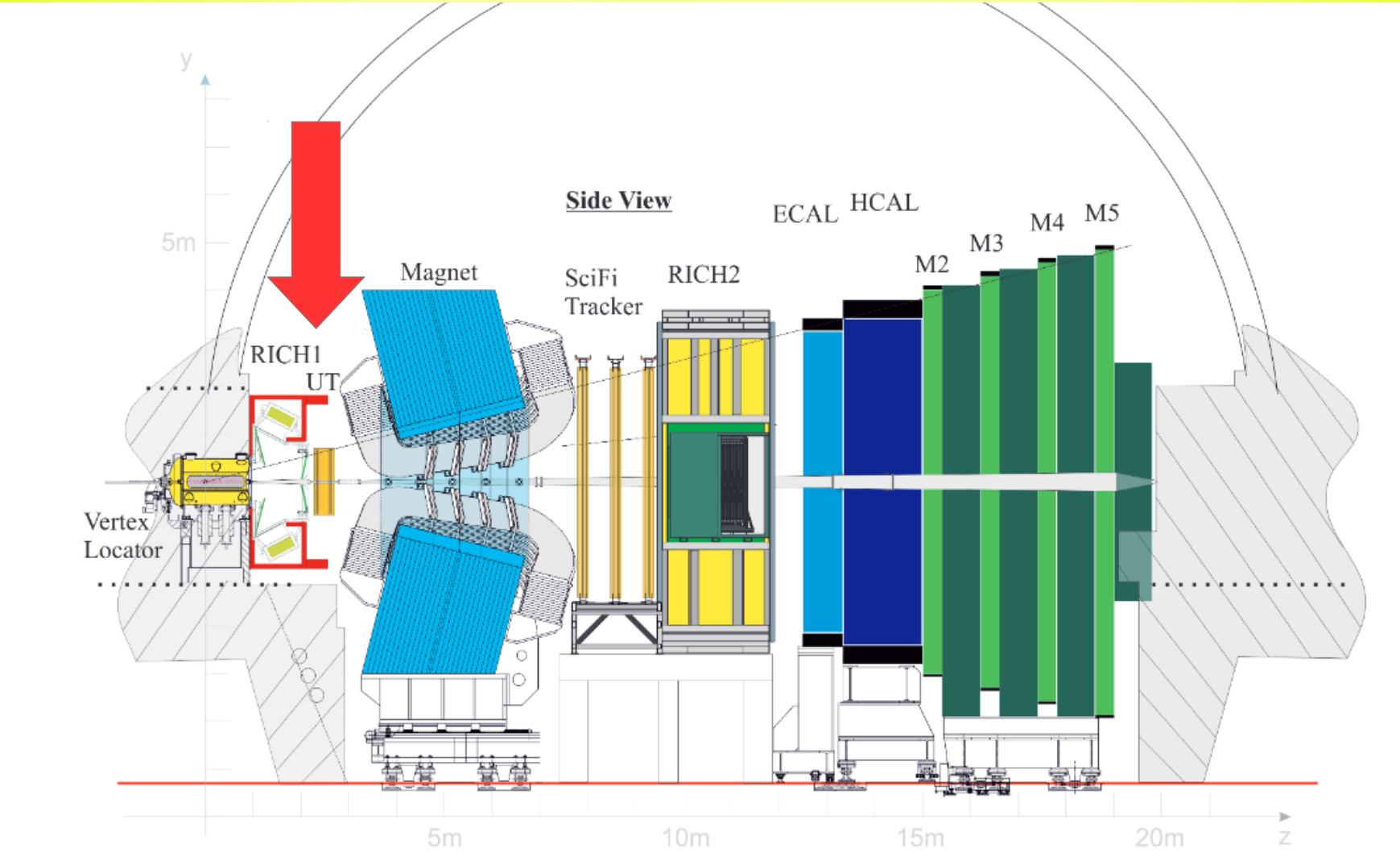
- LHCb – Large Hadron Collider beauty
- Upstream Tracker (UT) in modernised LHCb experiment
- Data Flow in the ST simulation (Boole)
  - current state
  - proposals of change for the UT
- New options for SALT front-end analog part emulation
- SALT front-end analog part emulation
- Summary

LHCb – Large Hadron Collider beauty

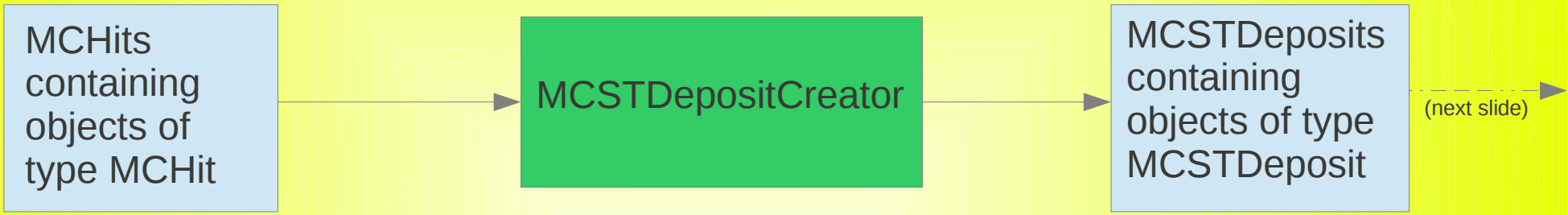
- LHCb – forward spectrometer (pseudorapidity coverage $2 < \eta < 5$)
- Excelent praticle identification and momentum resolution
- Studying CP violation
  - heavy quarks sector
    - by investigating rare B meson decays
- Precise CKM measurements (A.Dziurda: XXI Epiphany, January 8, 2015)
  - New physics
- Spectroscopy (excited $B_c^{\pm}$ meson state)



Upstream Tracker in modernised LHCb experiment



Data Flow in the ST simulation (Boole)



Definition of vector container type for MCHit

Algorithm for creating MCSTDeposits from MCHits.

Definition of Keyed Container for MCSTDeposit

Legend:

Objects / data

Algorithm

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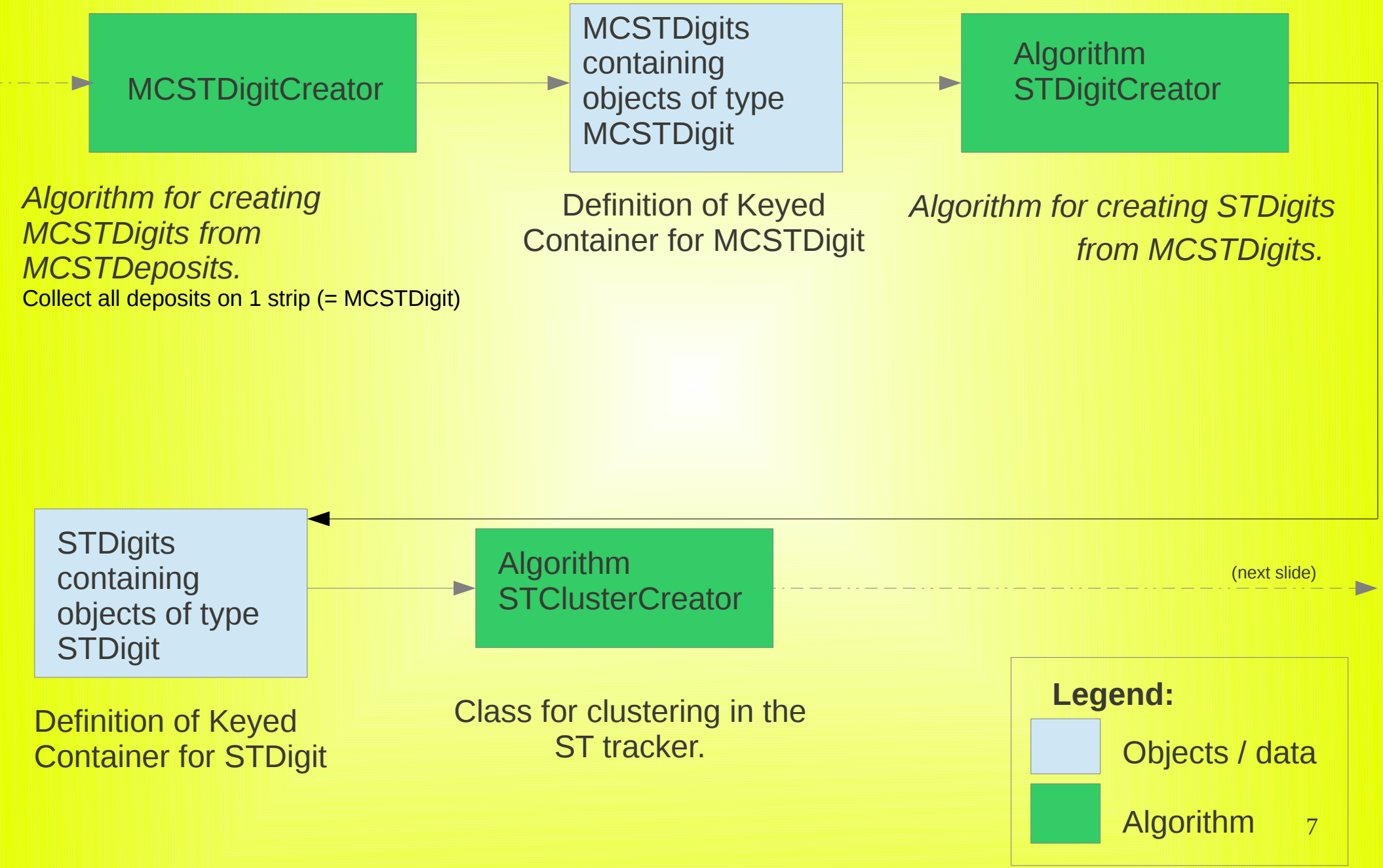

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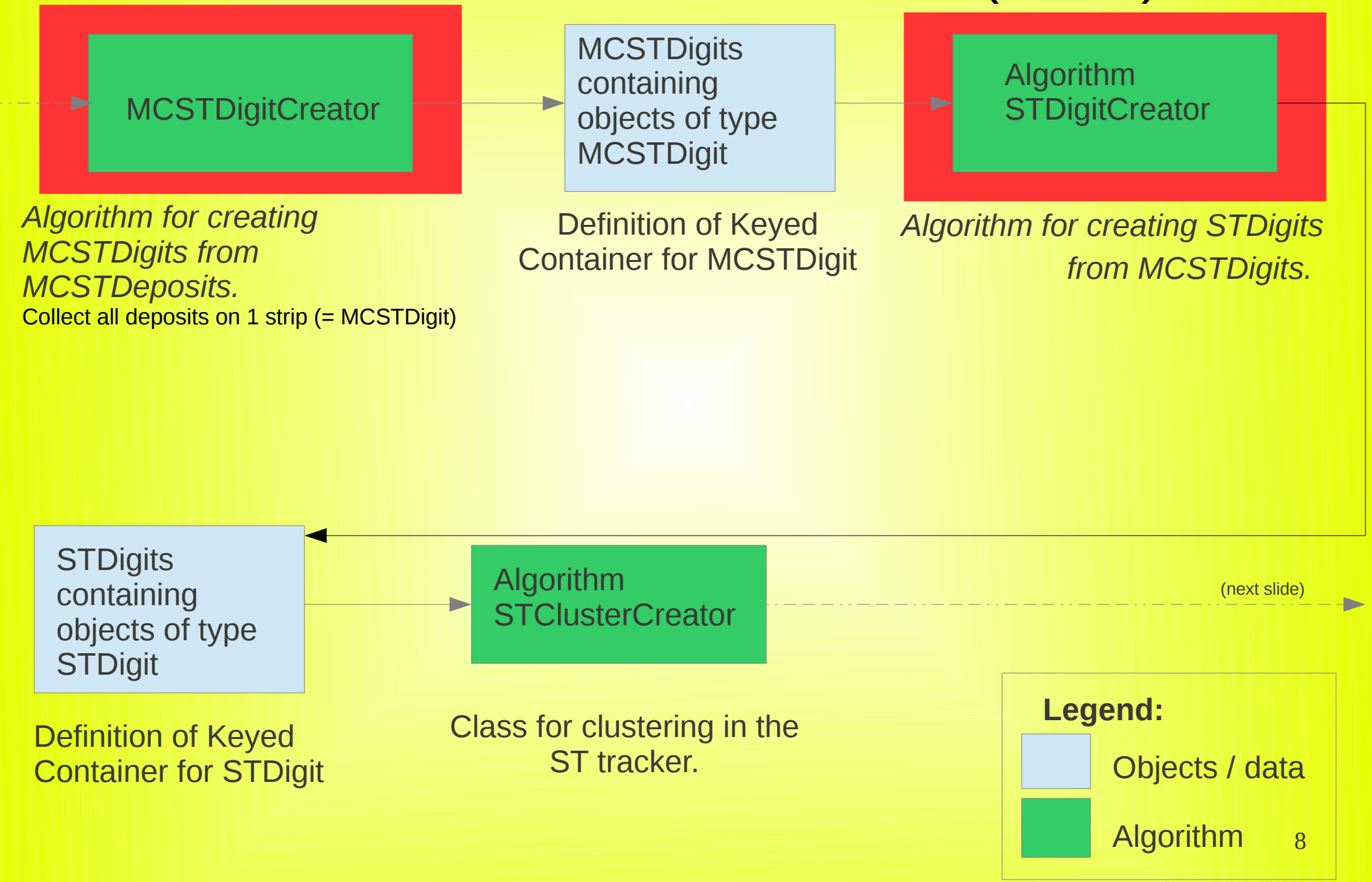

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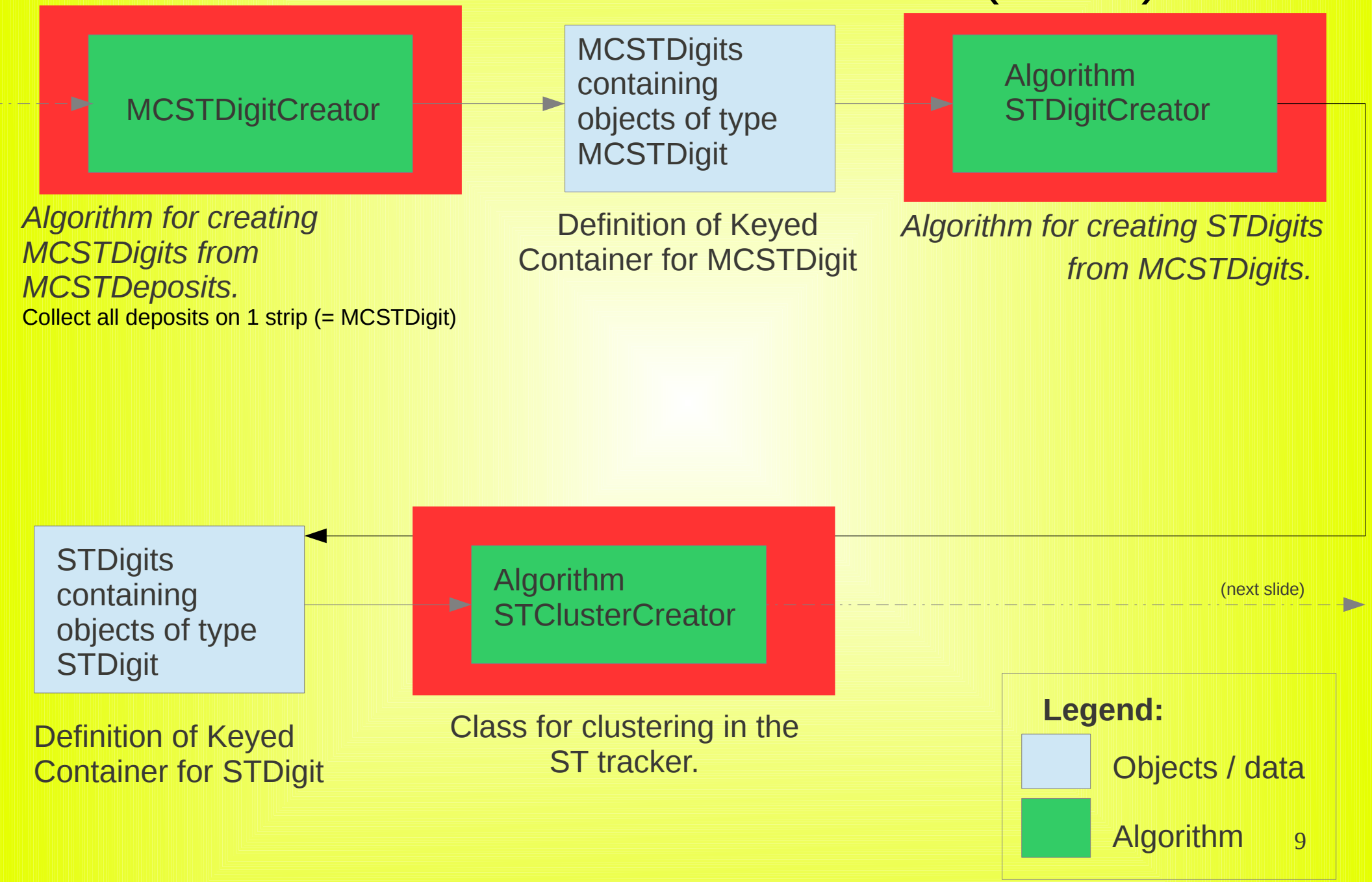

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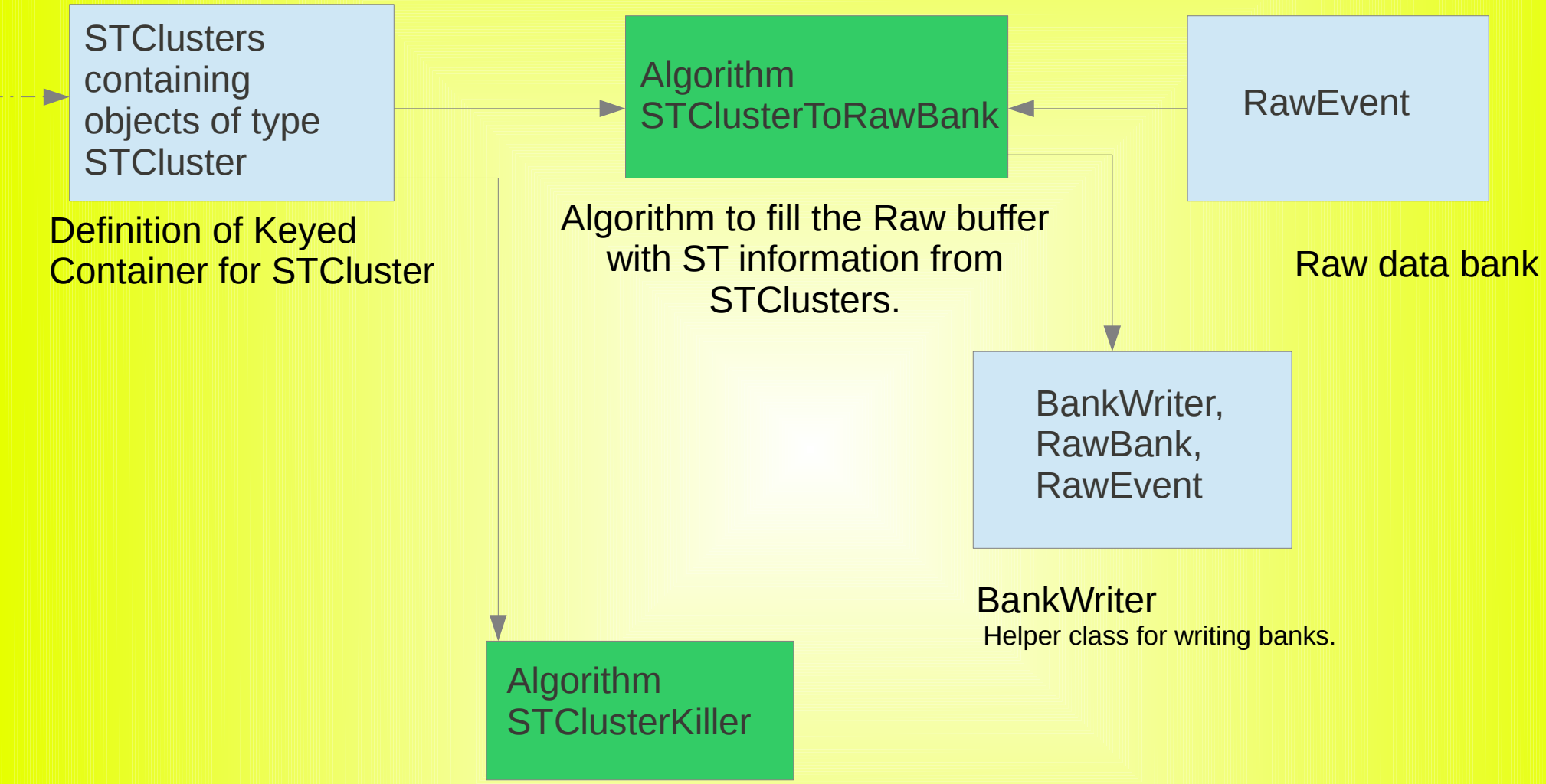

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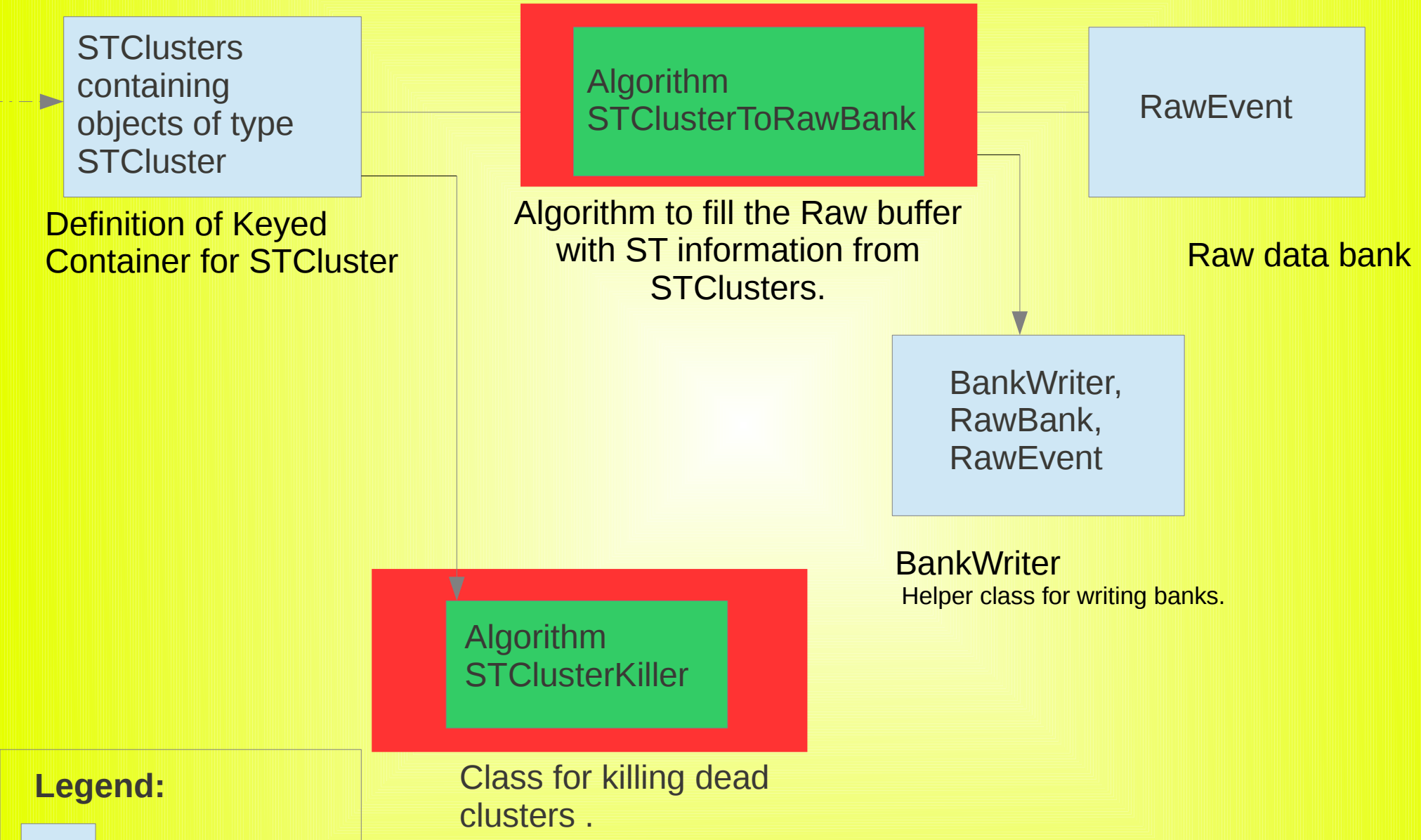
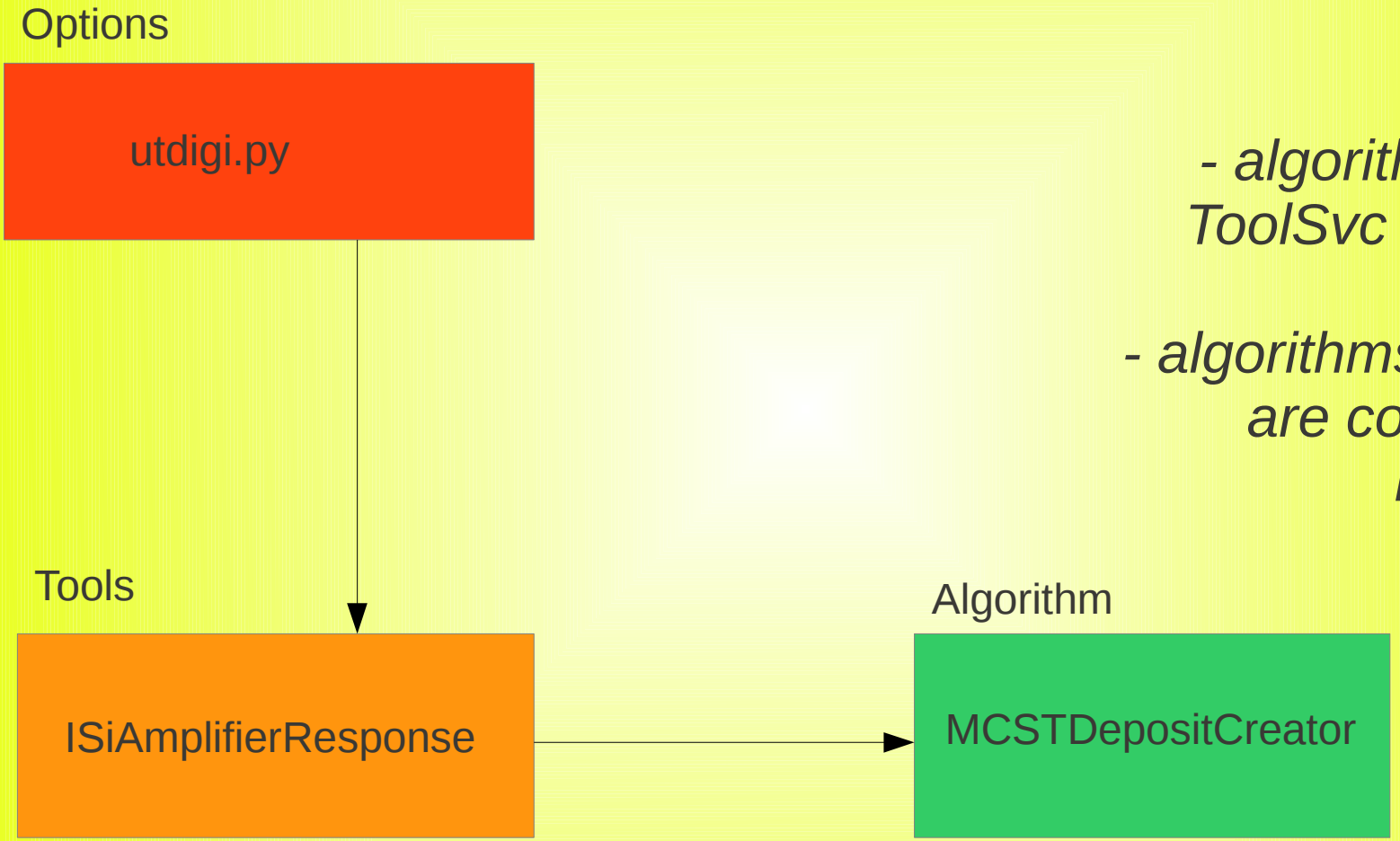
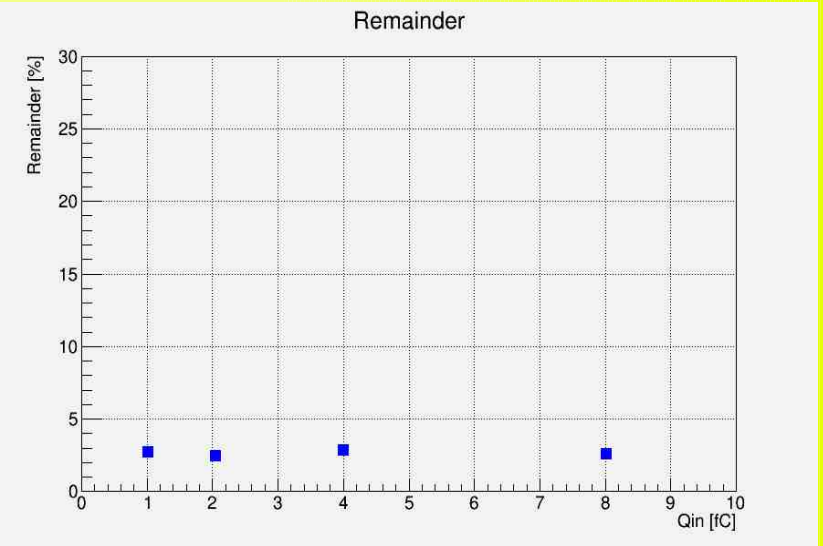


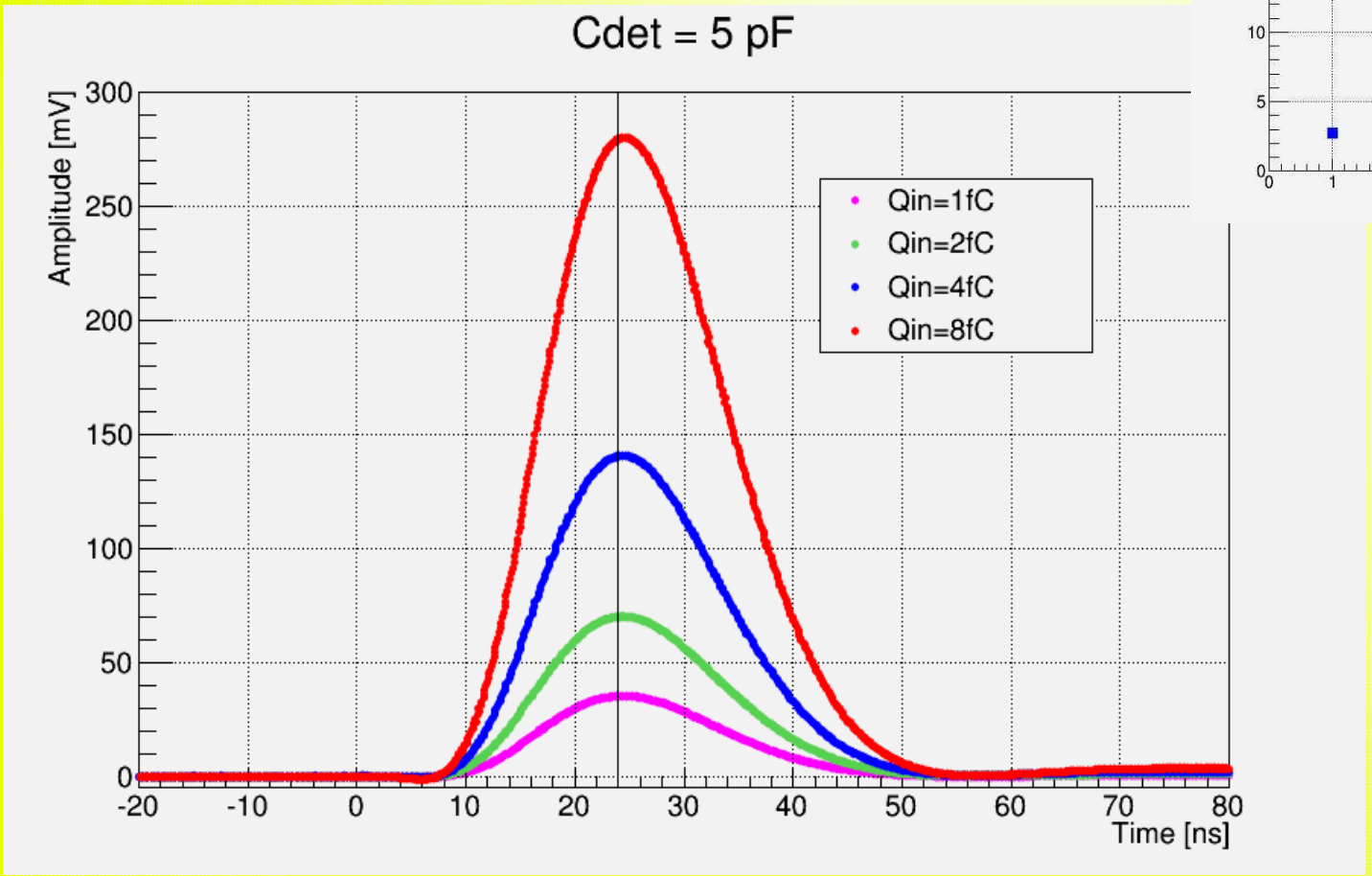
New options for SALT front-end analog part emulation



Tools:
- interface,
- algorithm ask the ToolSvc for a given Tool,
- algorithms and tools are controlled by Properties.

SALT front-end analog part emulation





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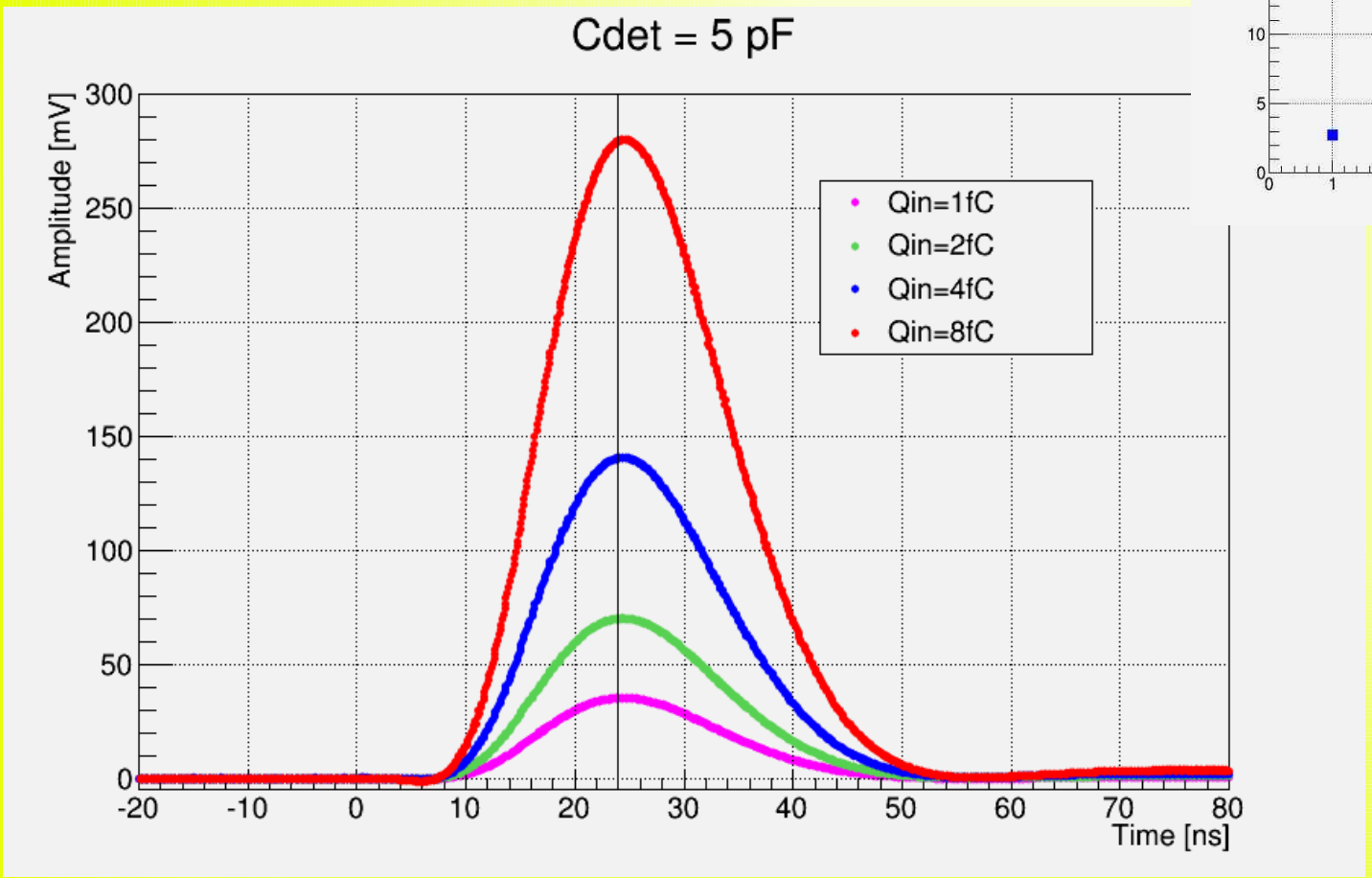
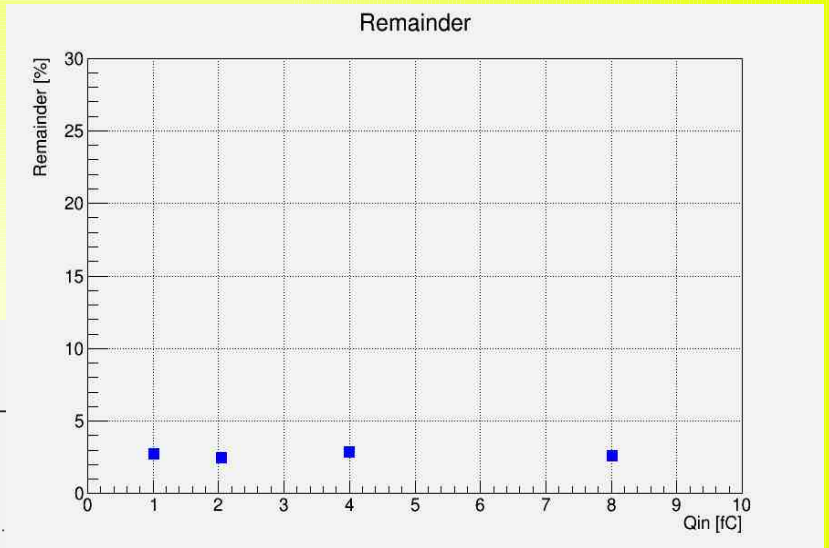
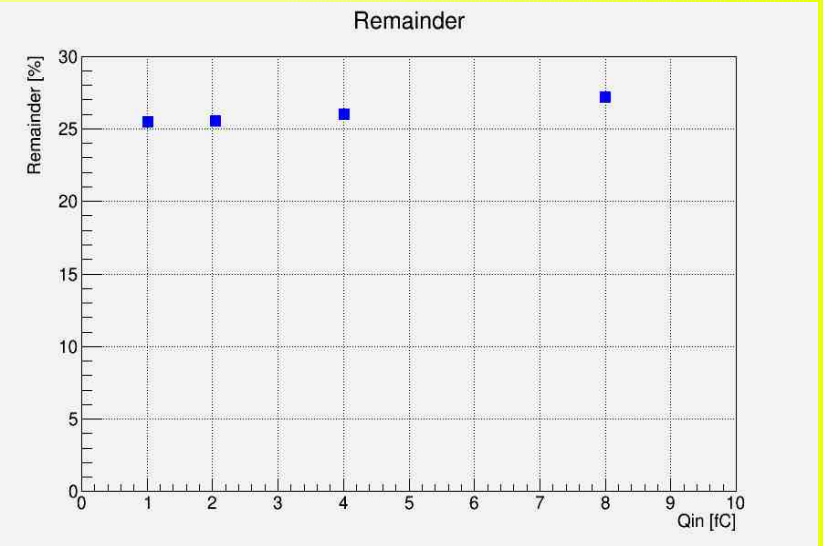
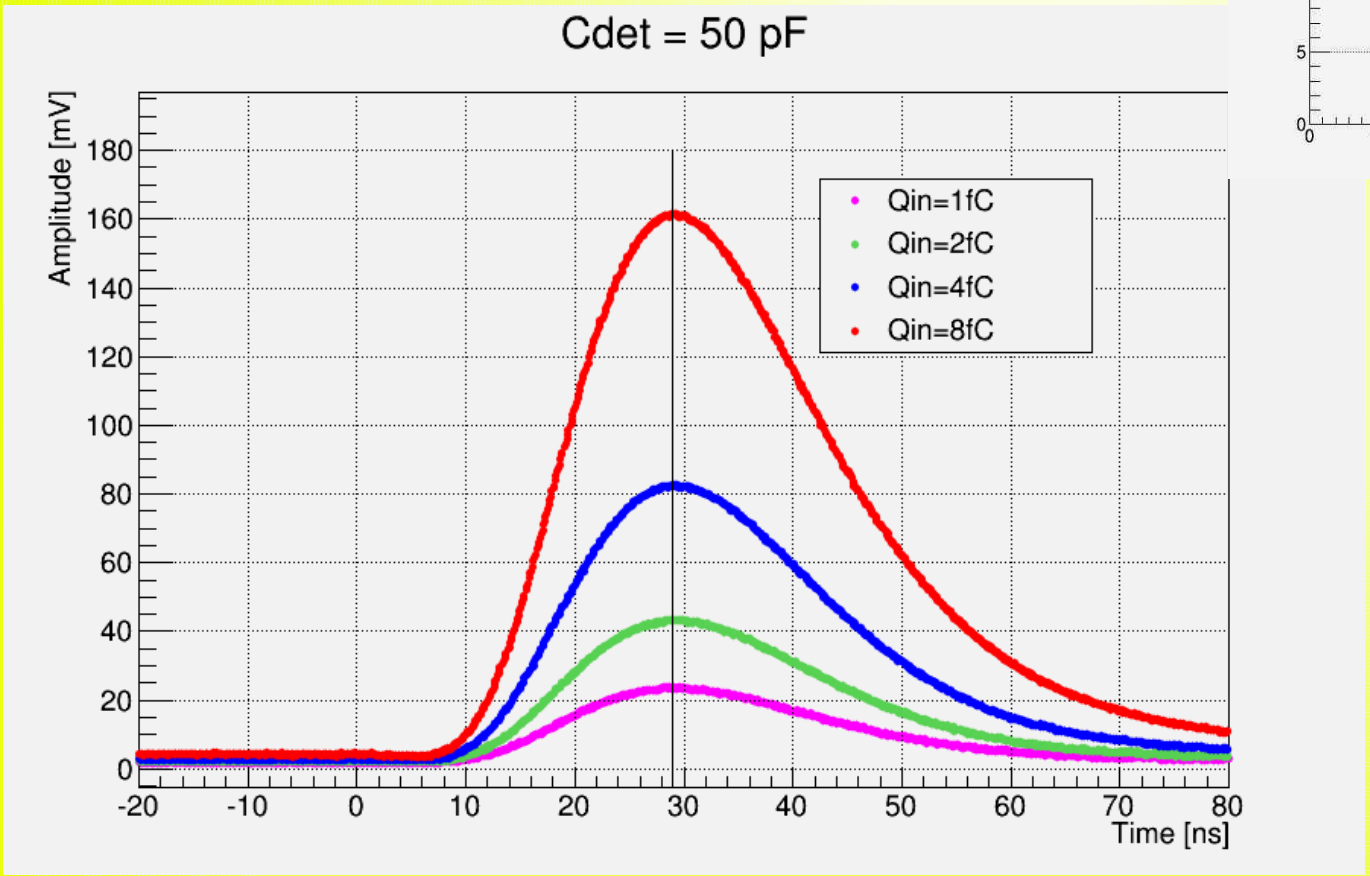




Remainder:
R=V25+/Vp

SALT front-end analog part emulation





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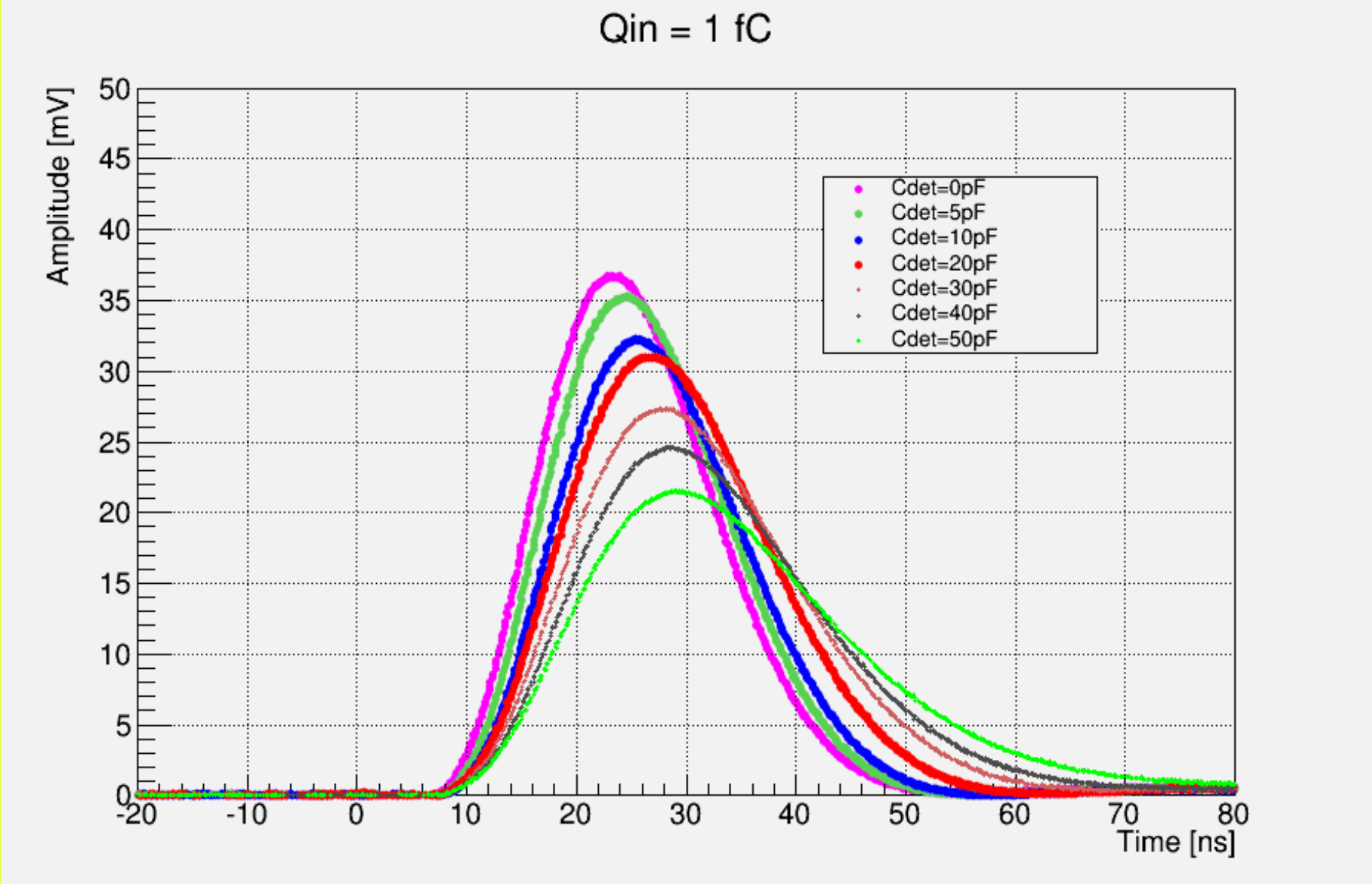

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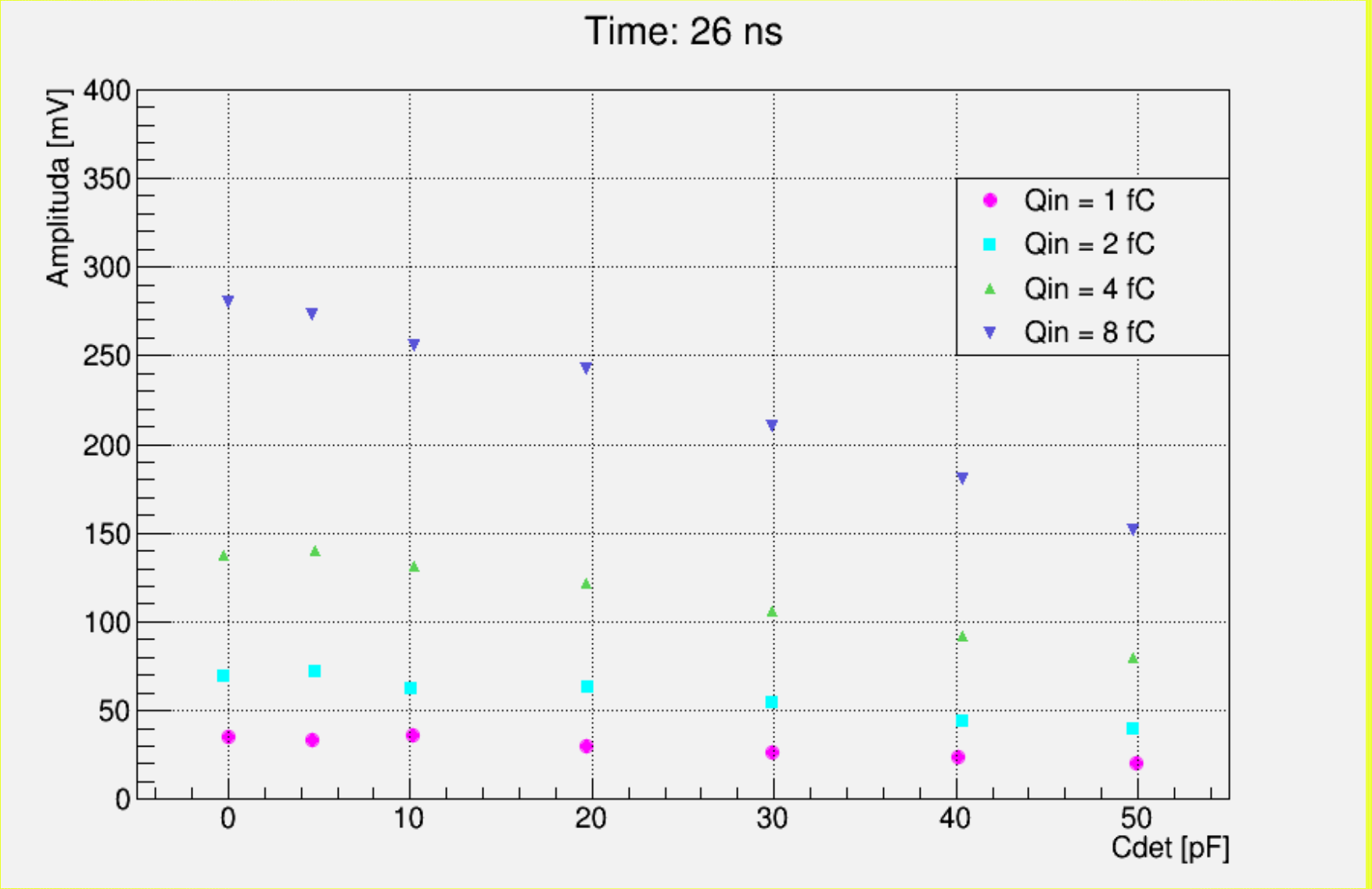

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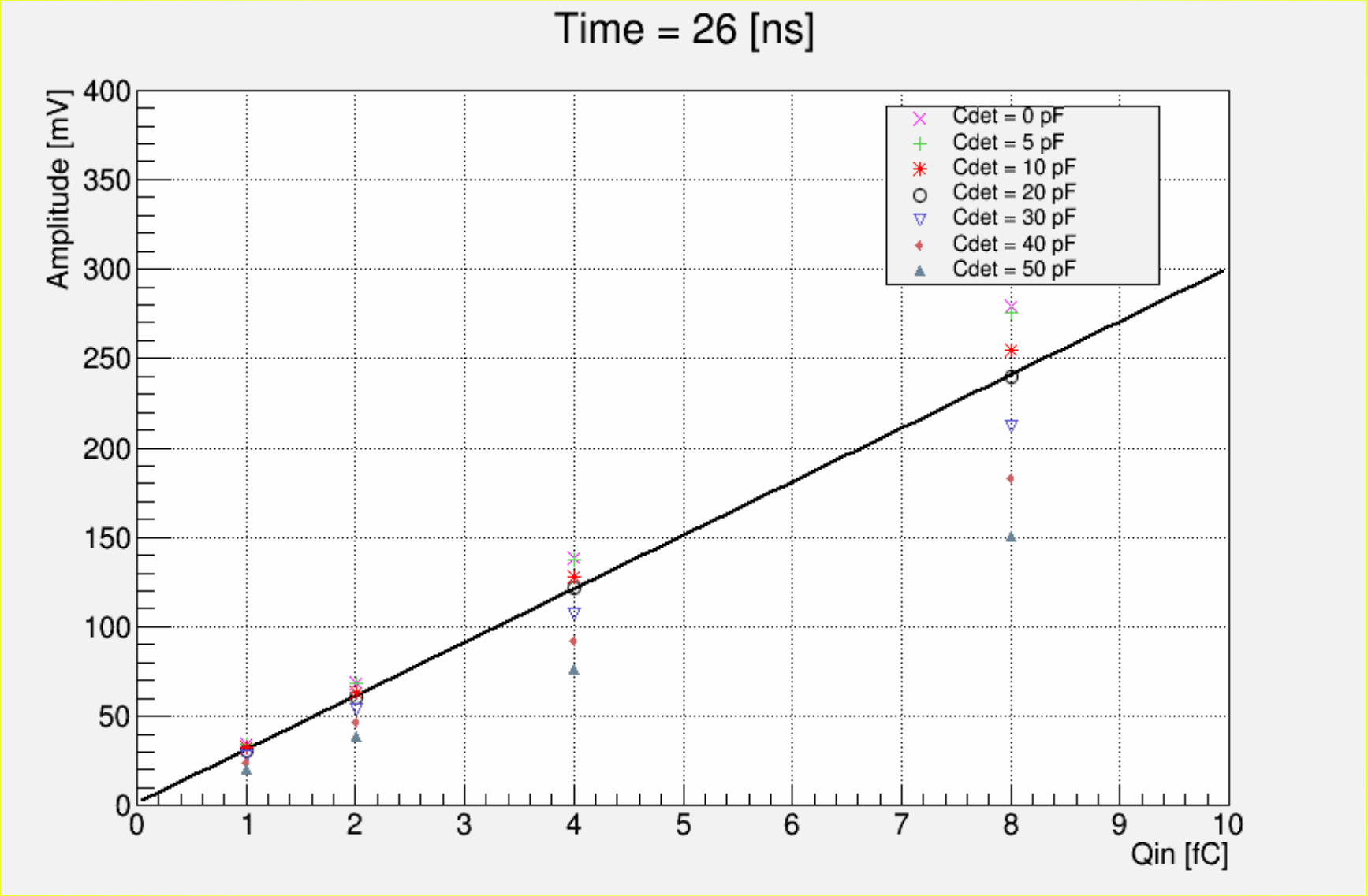

Summary

- Upstream Tracker will be a vital part of modernised LHCb spectrometer
- Current simulation algorithms will serve as a base for a new simulation sequence
- UT simulation is inseparable part of a Boole application (necessary in generation of MC samples)
- SALT (Silicon ASIC for LHCb Tracking) chip - critical part of UT detector

Thank you for your attention