

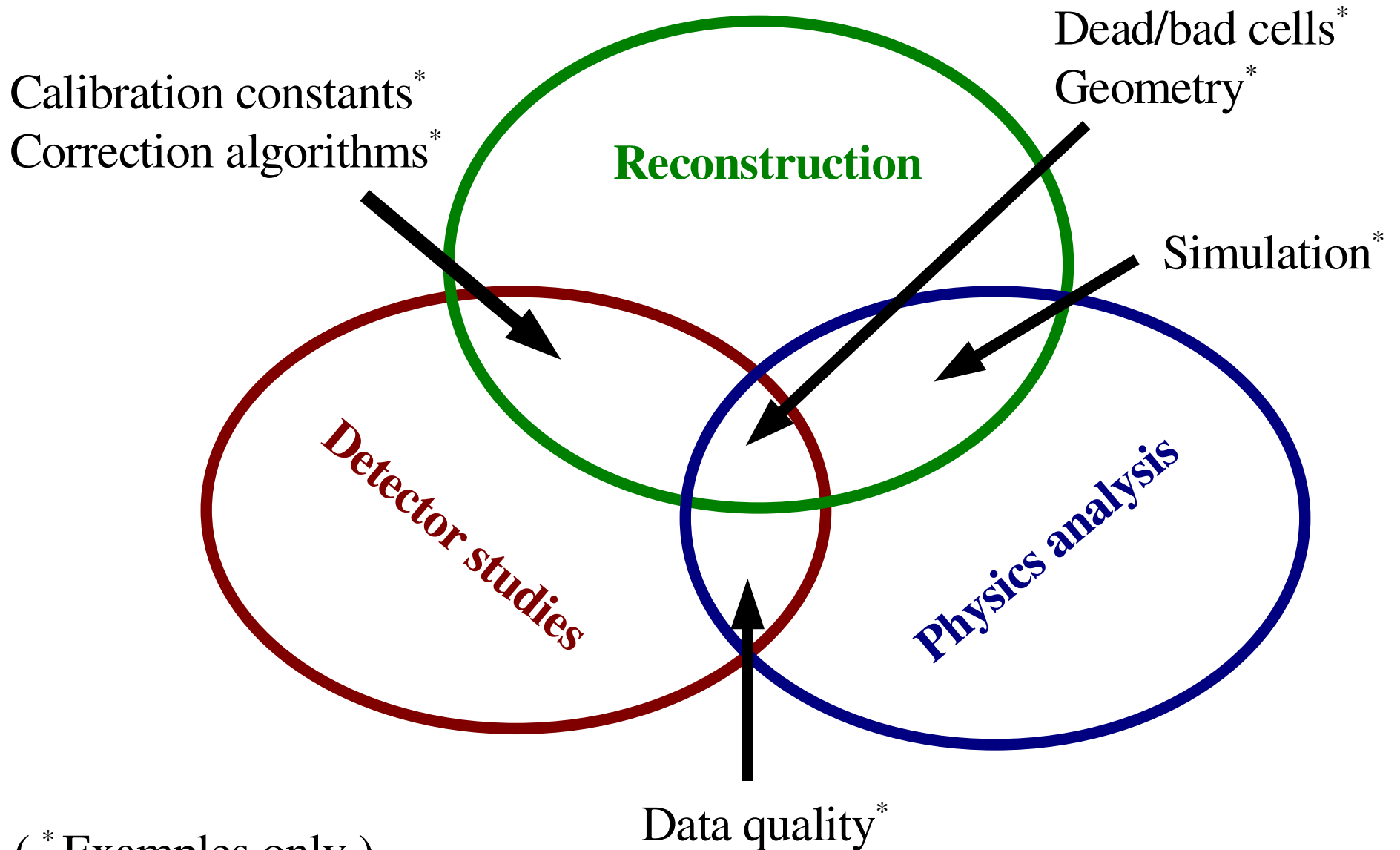
HCal Software

Some remarks on our most important tool

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HCal Main Meeting
30. May 2008

Reconstruction – Detector Studies – Analyses

Software Demands



(* Examples only)

Setup at DESY

- * We need a flexible development environment and not just data calibration algorithms – the system is too complex
- * Decided to set up a 'coding playground' at DESY:
 - software repository (auto-update of central CALICE CVS changes)
 - three centralized builds: stable, pro, pro_test
(see talk by Angela @ Argonne, March '08)
 - documentation: <http://www-flc.desy.de/flc/flcwiki>
- * Installation became (unintendedly) very popular (NIU, Bergen, ...)
- * **THIS IS (AND WAS ALWAYS MEANT TO BE) A DEVELOPMENT SANDBOX, NOT A CODE AUTHORITY!**
(read: 1. you are invited to use it, but you don't have to
2. code (especially concerning HCal) can be preliminary
3. we are not failure-proof, so be on the watch
(SL3 vs. SL4, synchronization with CVS, ...)

HCal: Data to Paper

1. Operation, adjustment, fast feedback
2. Determination of calibration constants
3. Reconstruction (= calibration and correction)
4. Detector studies, e.g. electron data (\Rightarrow S. Richter)
5. In parallel: understand beam line and data quality (\Rightarrow A. Vargas)
6. In parallel: understand data-MC-discrepancies (\Rightarrow V. Morgunov)
7. In parallel: start physics studies (\Rightarrow S. Lu)
8. Sit together, review progress, channel knowledge, restart at 3. (2.?)
9. Actually analyze physics, eventually re-iterate from 3. (2.?)
10. Write a paper and publish the results

HCal: Data to Paper

1. Operation, adjustment, fast feedback

2.

3.

4.

5.

6.

7.

8.

9.

Avoid re-inventing wheels here!

I know lots of things are imperfect, but they
will never improve if we do not do it together.

10. Write a paper and publish the results

HCal Reconstruction

- * Calibration routines well established (MIP, gain, electronics)
- * Corrections: SiPM response curve, tile cross-talk, temperature dependent calibrations, ...
- * Digitization studies drive correction strategies

	Digitization	Reconstruction
Individual response curves	released	released
Response scaling	devel	devel
Temp-dependence	devel	N/A
Tile cross-talk	released (untuned)	N/A

HCal Reconstruction

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LCWS '07	Digitization	Reconstruction
Individual response curves	released	released
Response scaling	devel	devel
Temp-dependence	devel	N/A
Tile cross-talk	released (untuned)	N/A

HCal Reconstruction

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CALOR '08	Digitization	Reconstruction
Individual response curves	released	released
Response scaling	devel	devel
Temp-dependence	devel	N/A
Tile cross-talk	released (untuned)	N/A

Where do We Stand?

- * Operation, calibration, and reconstruction worked smooth for FNAL
⇒ we gain experience, but maintainability still could be better
- * New features are not easily integrated
⇒ software system not very flexible, quite a lot of effort goes into day-to-day patches (no general problems with lcio/Marlin)
- * Easy interfaces to get available information are often missing
⇒ makes detector studies and analyses sometimes tedious
- * Coordination with other systems is getting better
⇒ what about geometry, simulation, analysis tools?
- * Often depend on CALICE-wide developments (trigger, tracking, ...)
⇒ try to solve 'a' problem rather than solving 'your' problem