Detector Challenges

- the ideal detector has a zero-mass tracking system and an infinite-mass calorimeter.

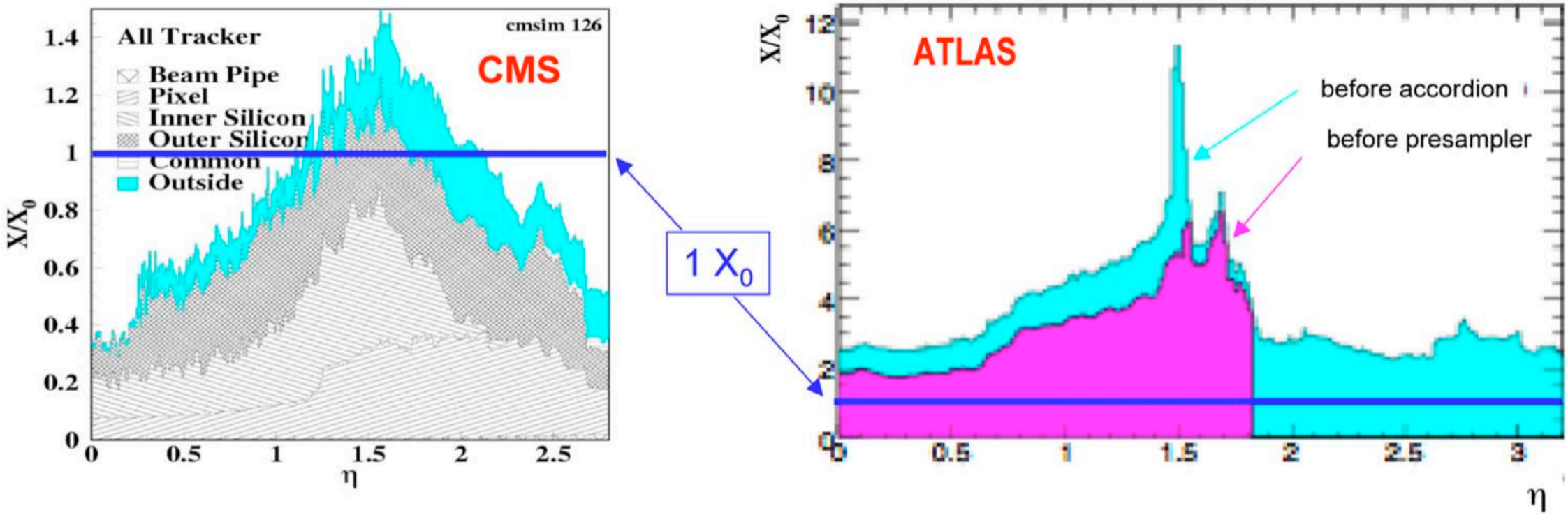
- hadronic calorimetry, as always

- design an iron-free detector

- do something smart about the forward direction, inside 10-degrees

- management: very difficult, in my opinion

The ideal detector has a zero-mass tracking system and an infinite-mass calorimeter.



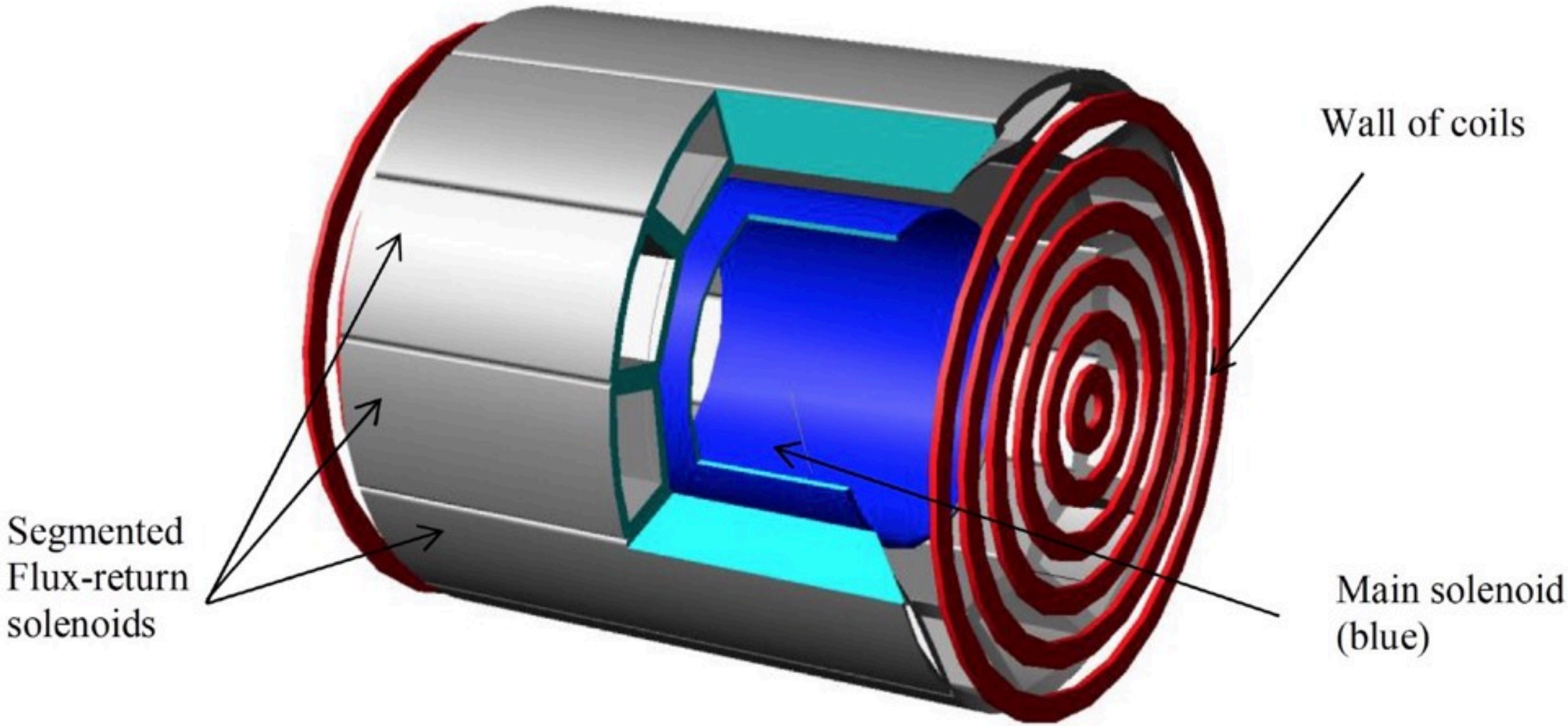
This happens for complex reasons: lack of foresight in design, engineering, funding crunches, ...

Hadronic calorimetry, as always

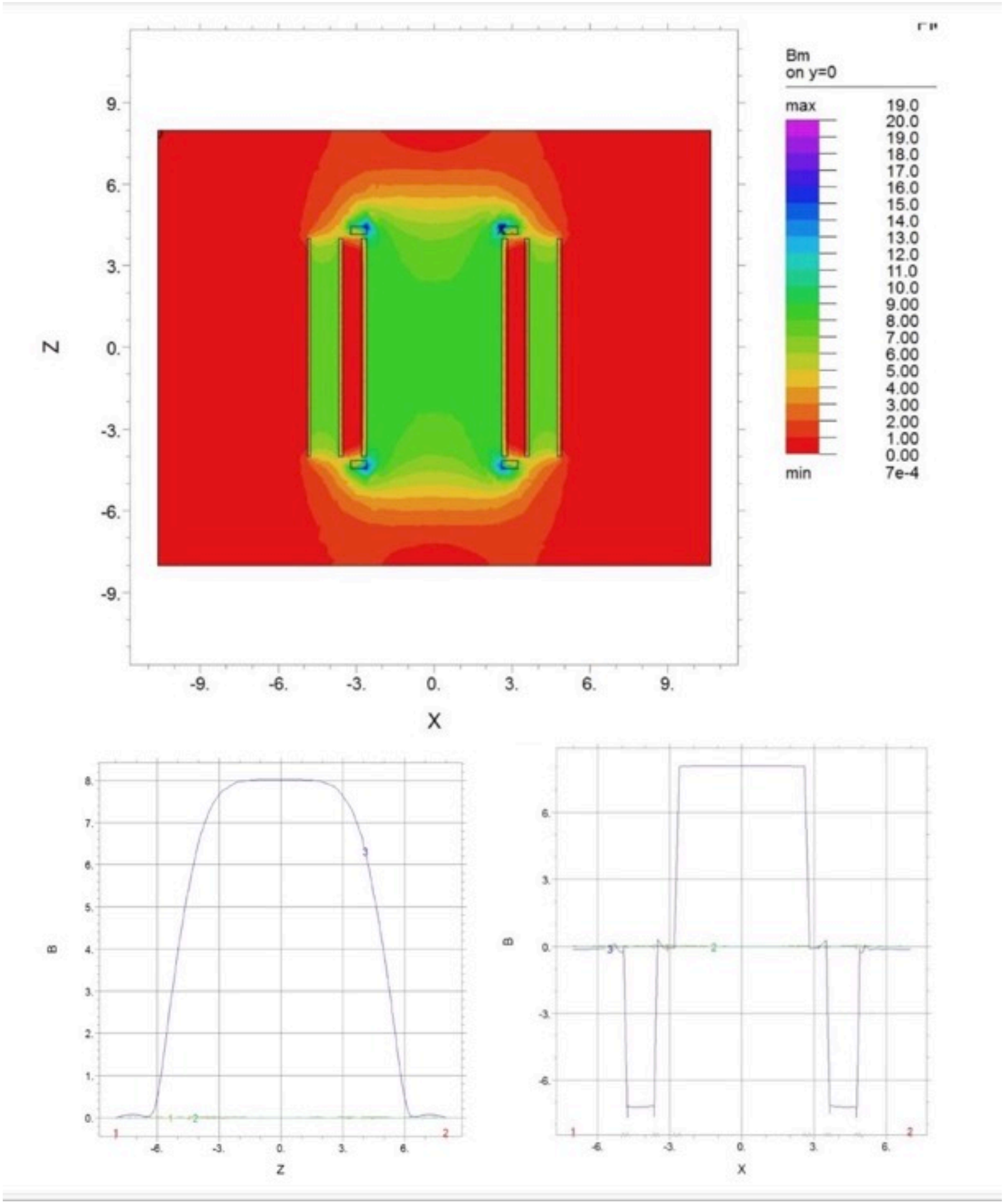
Get below 2% energy resolution at
high energy ~300 GeV jets

“unification of experimental resolutions”

Design an iron-free detector



Higher quality field than with iron, vastly lower internal forces, no fringe field, no field on beam line elements, no problems with floor loading in the IR, lots of free volume for new detectors far from the IP, easy access to interior of detector, ...



Do something smart about the
forward direction, inside 10-degrees

1. instrument the final quad

2. dipole downstream

3. followed by a calorimeter?

Management: very difficult, in my opinion

In the end game of building a big detector, the physicists have to stop fiddling around, stop having new ideas, and focus on building to a schedule. The TPC (Nygren, LBL) almost failed. Some people thought that Panofsky would "put this group out of its misery."

Austin Ball, CMS/LHC, juggled a thousand items.

Lesser challenges:

1. Vertex chambers with pixels seem to be in very good shape

2. The ILD TPC is very beautiful

3. Do we need a lower mass tracker, with the redundancy, dE/dx, and precision of a TPC? KLOE chamber?