

Investigating Behavior of Fitter

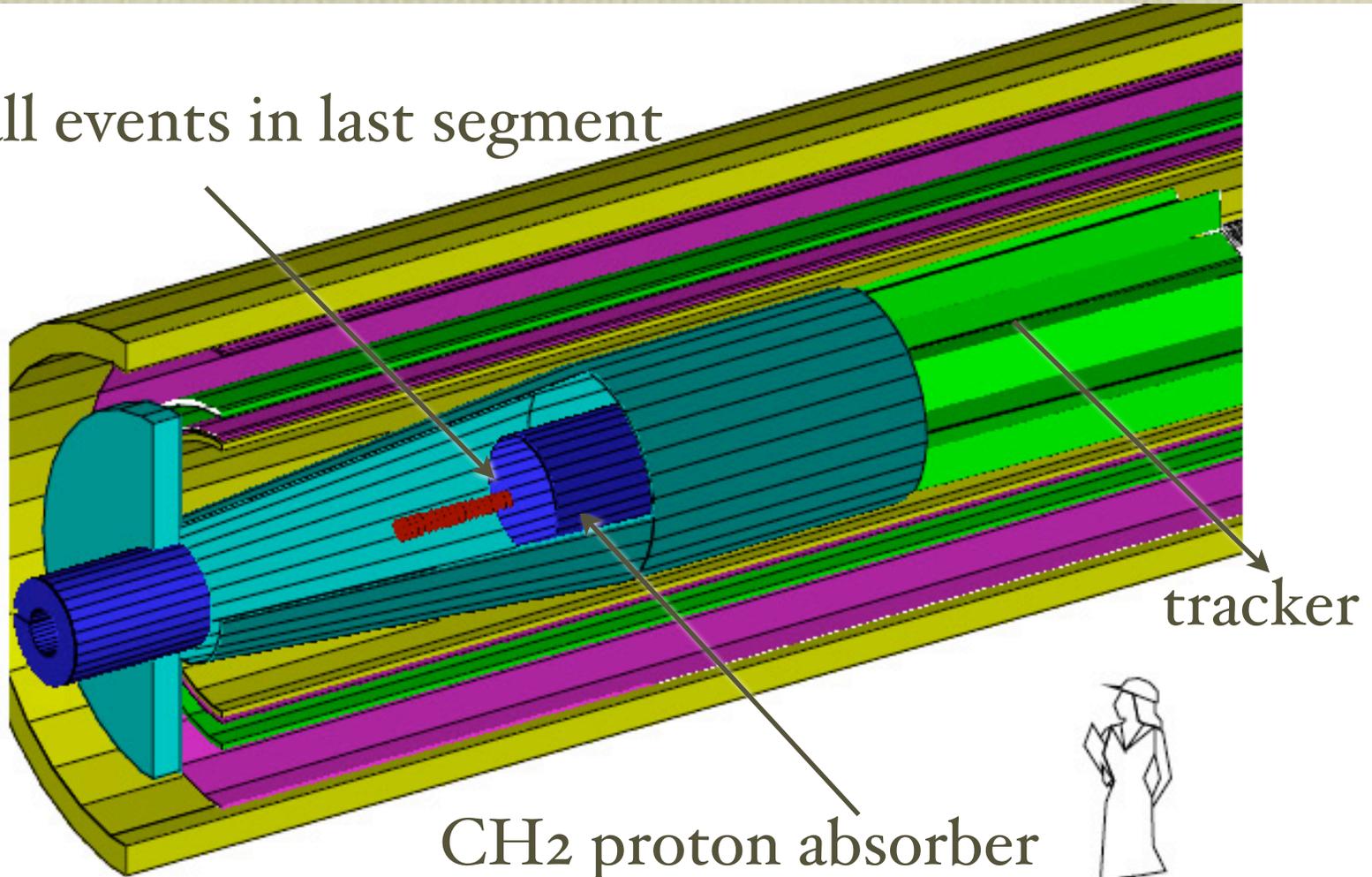
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Understand problems

- First recapitulate
- Then give explanation
- Possible fixes

Quick Overview of Detector

target: all events in last segment

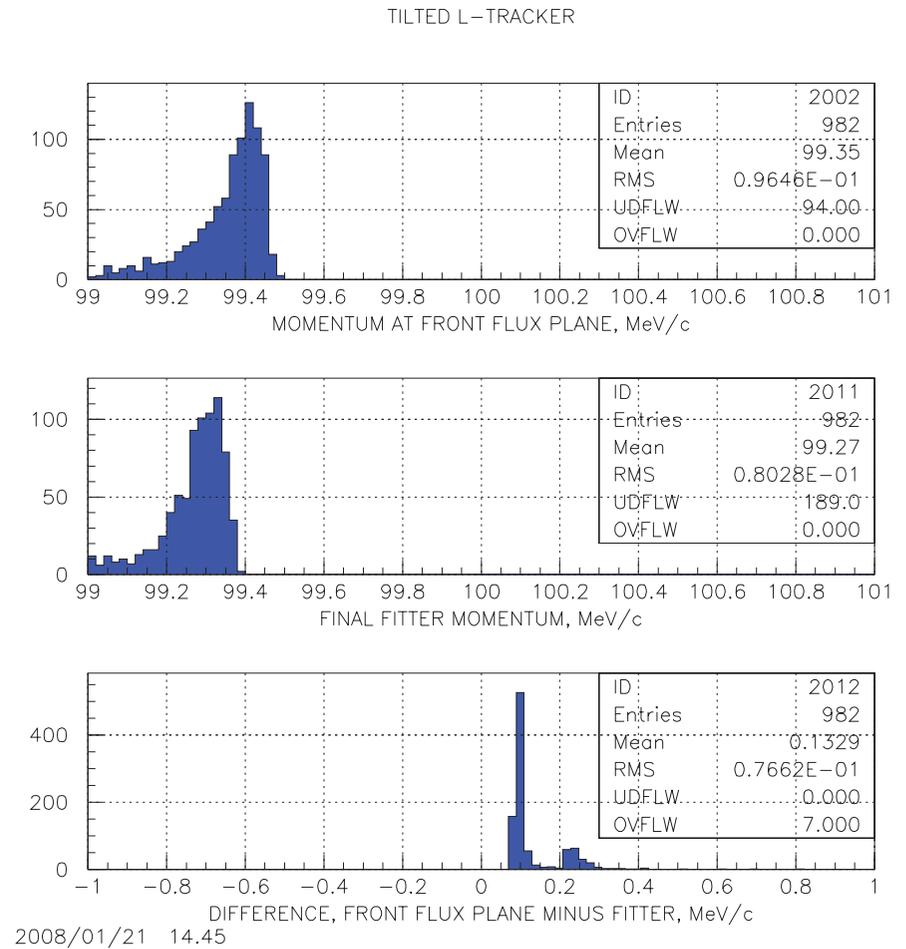


CH₂ proton absorber

politically correct drawing of typical physicist, but the skirt doesn't quite work

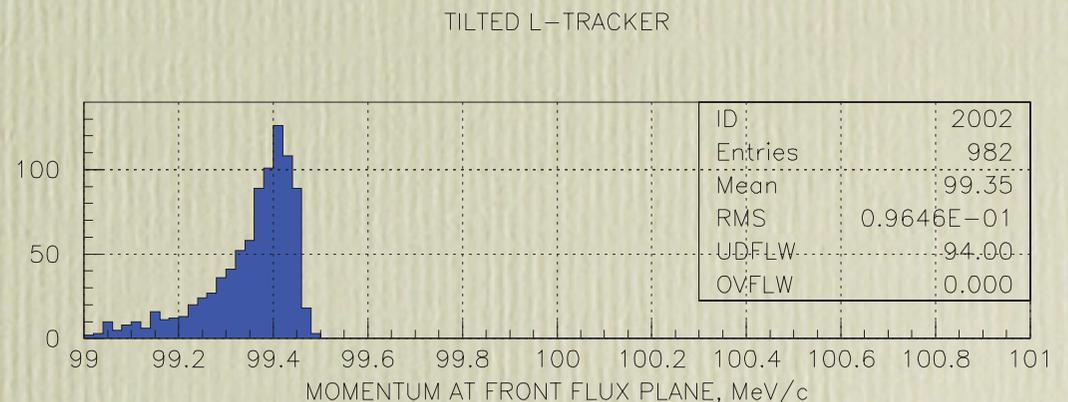
Problem

- Fed = 100 MeV DIO
- Target is “vacuum”
- DIO occurs at center of last target segment
- All measurement errors = 0
- *Every event ought to be the same and reconstruct at 100 MeV*



More Detail:

- Top Plot is at “magic flux plane” designed to be “sensitive vacuum” and measure true momentum: why is there energy loss?
- Because “magic flux plane” was not sensitive vacuum, but “average straw material”
- this is a bug

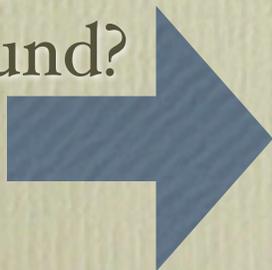


Why Are Two Peaks?

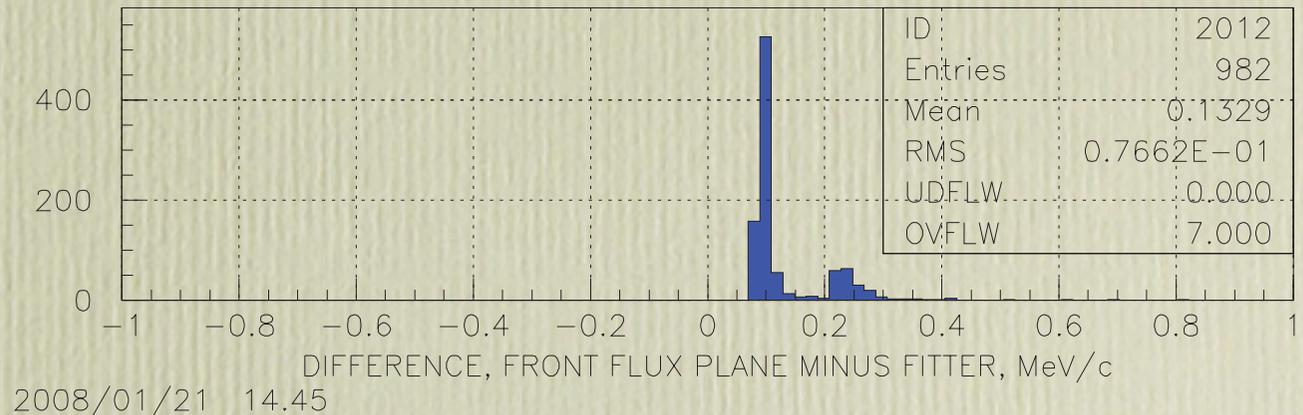
1. Because some tracks pass through CH₂ and some don't

2. Depends, I am sure, on target segment

3. Does fraction passing through CH₂ differ signal to background?



for “well-reconstructed DIO” near end-point probably not -- but needs to be understood



Why Bug Isn't Fixed

- Should simply (hah!) redefine magic flux plane (MFP) as sensitive vacuum
- However, there is a minimum energy cut, dE_{hit} , in “vmeas_nhit” that prevents hit in MFP from being used (vacuum, sensitive or not, has no energy loss)
- Seems to be a capability of setting dE_{hit} to zero or -0.1 (commented-out lines) but why isn't this done? Time? Other?

Next

- Fix all this
- Keep trying to get delta-fcn to reconstruct as delta-fcn and see if bias to fitter
- start turning on real world one step at a time and see if we understand it.

