Longitudinal Issues

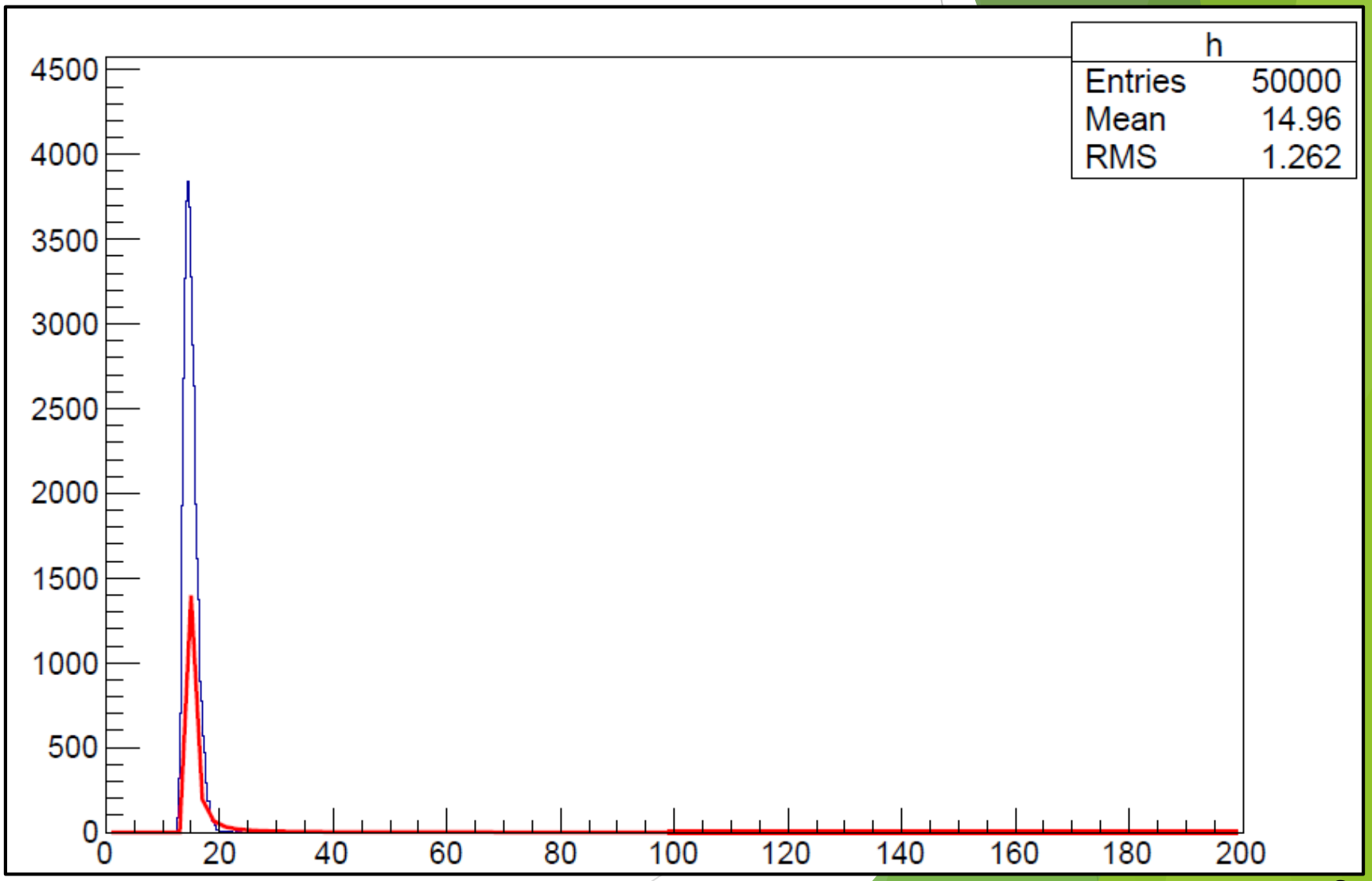
04.07.14

Review

- Landau fitting is now possible in ROOT
- Confirmation that the COSY Landau generator is accurate
- Currently have ICOOL data for straggling as a function of mean energy loss

Problem

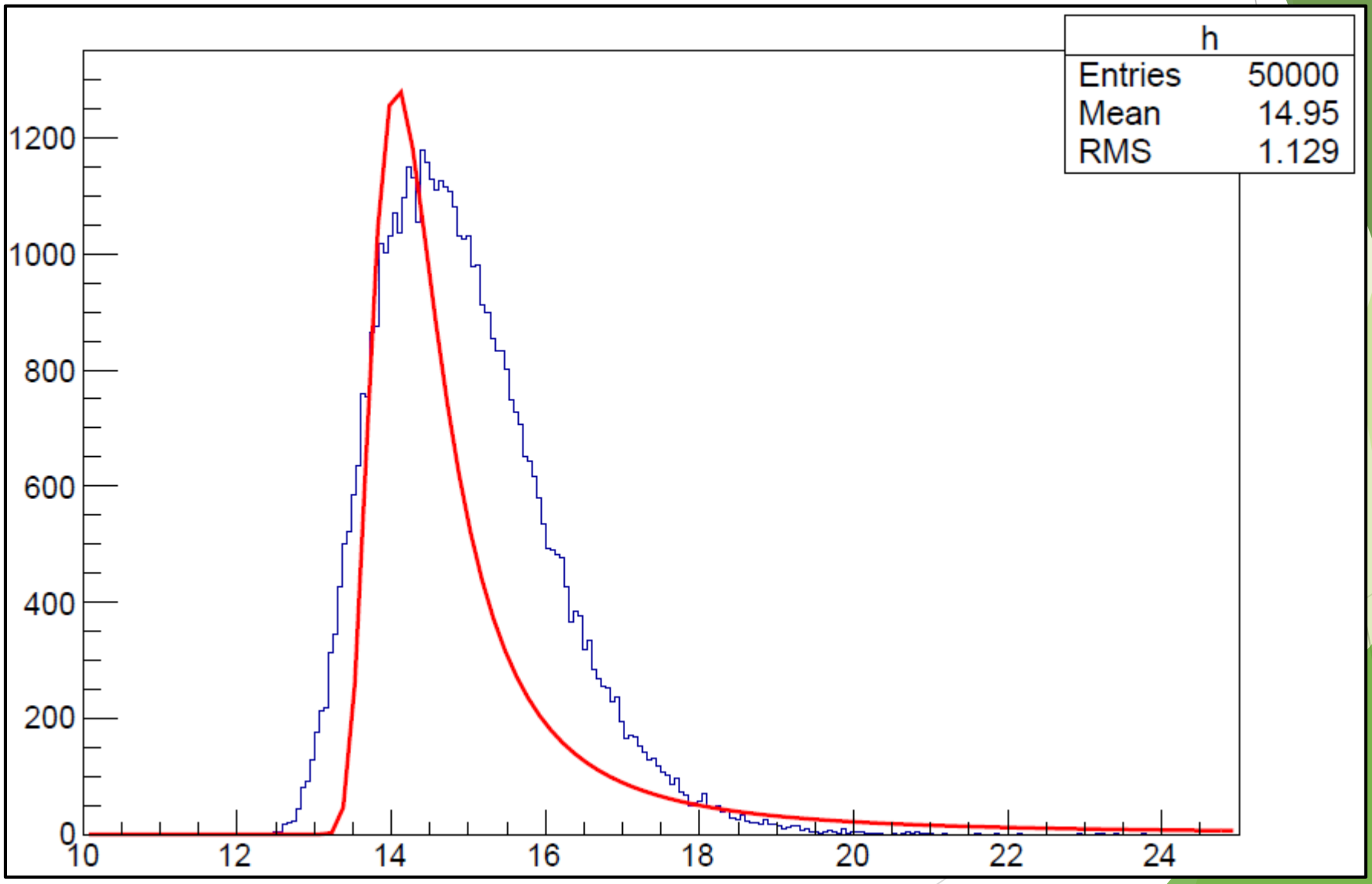
- Straggling is *not* Landau in the interested range
- Transverse is still Gaussian, thanks to the central limit theorem
- Ex: fit Landau distribution to the ICOOL result of a pencil beam with average pz loss of 15 MeV:



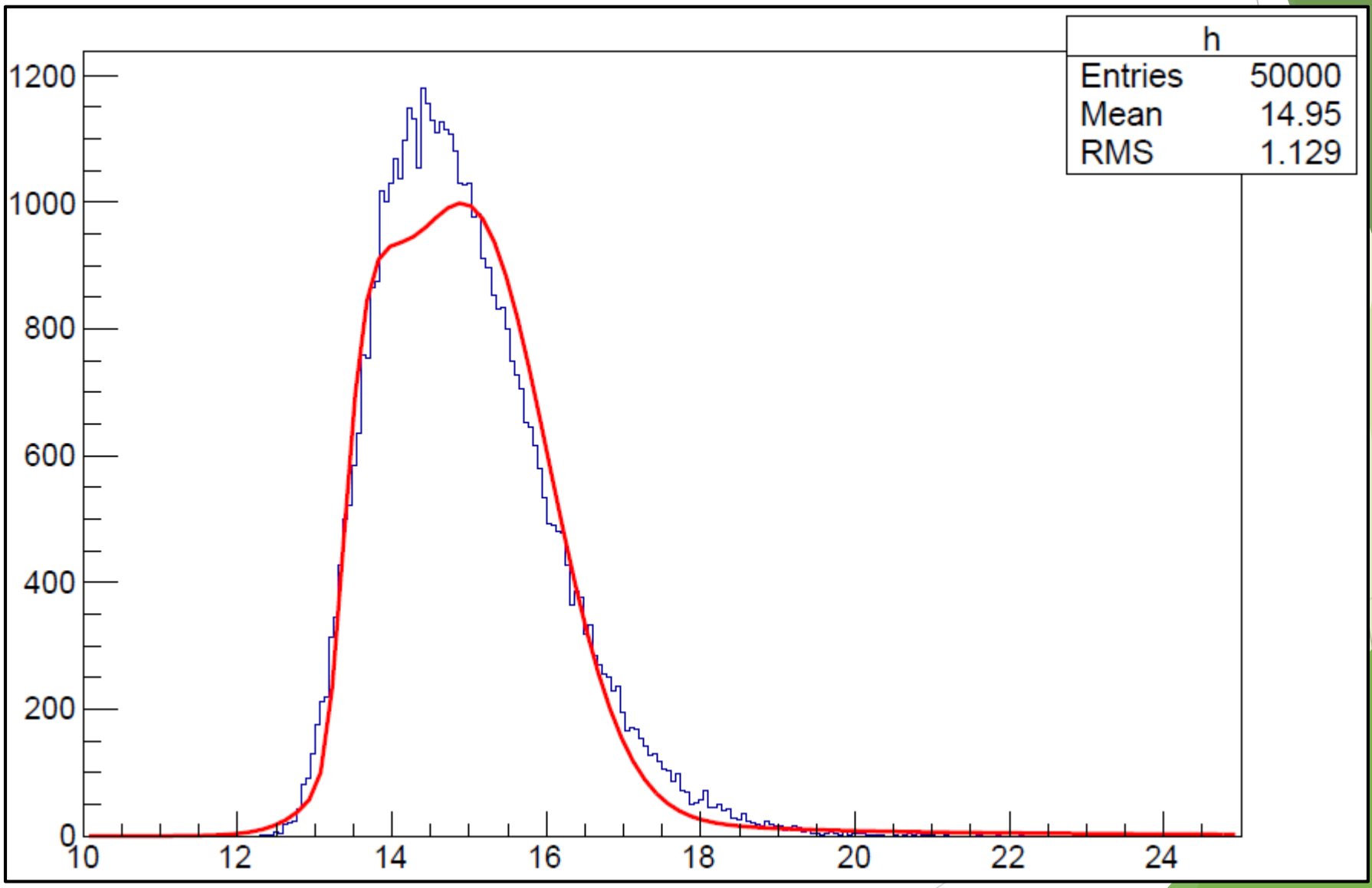
Solutions

- From the ICOOL result, only 10 particles (out of 50,000) outside the energy loss range of (10, 25) MeV, which is practically a statistical blip
- Try Landau fit in peak area only
- Thin absorbers produce a Gaussian distribution, so try a mix of Gaussian/Landau fit
- Try Enge functions

Results: Landau near peak



Results: Gaussian/Landau near peak



Results: Enge near peak