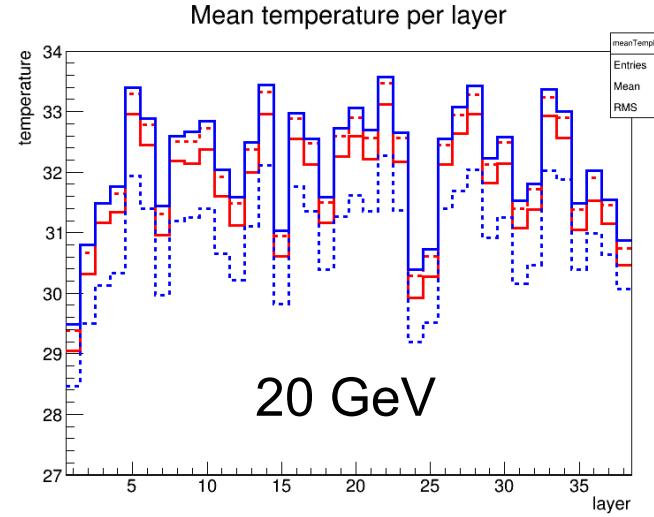
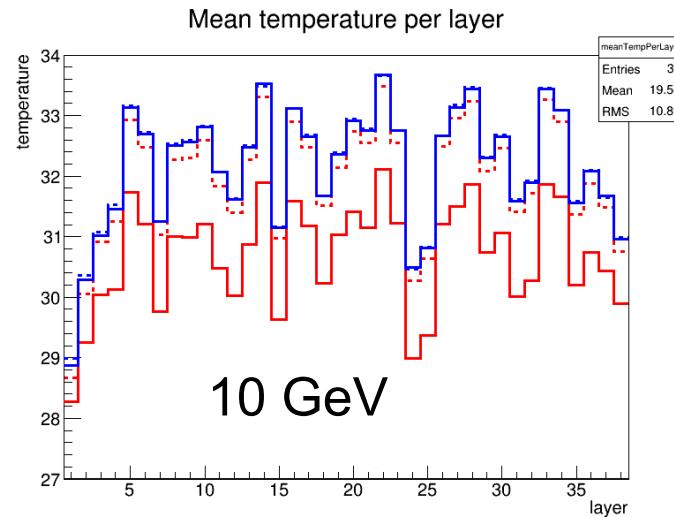
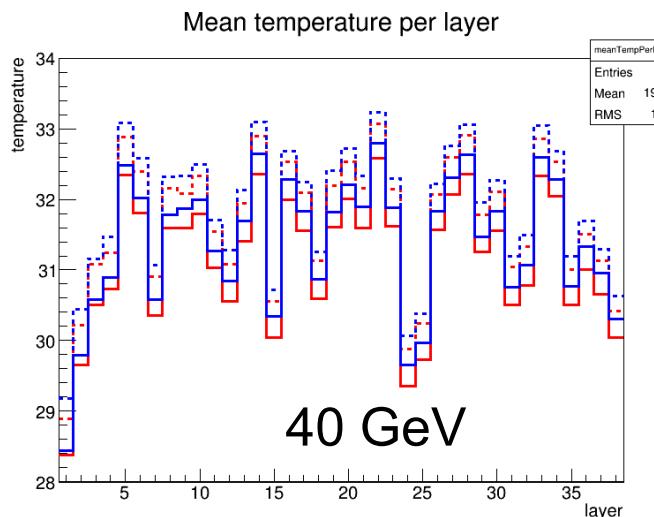
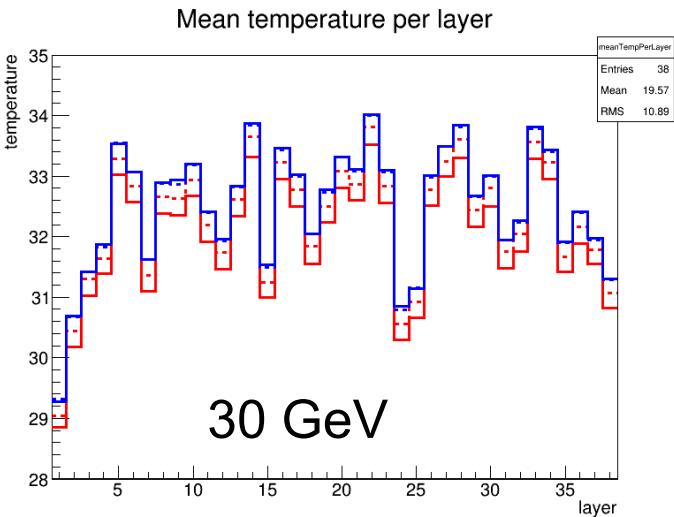

Temperature measurements

24.08.2018
Anna Rosmanitz
AHCAL analysis workshop

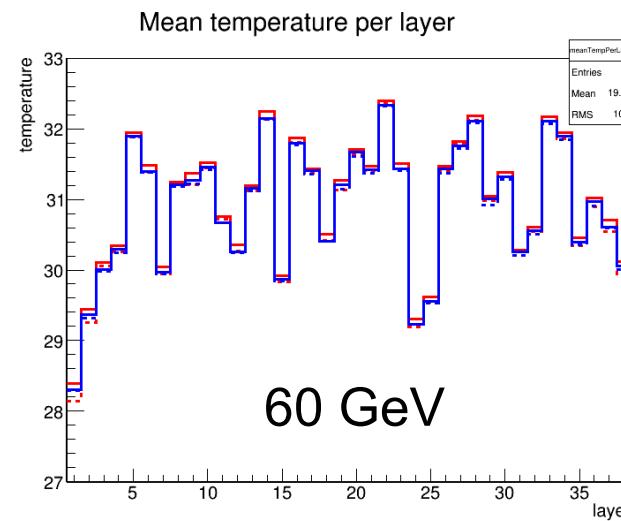
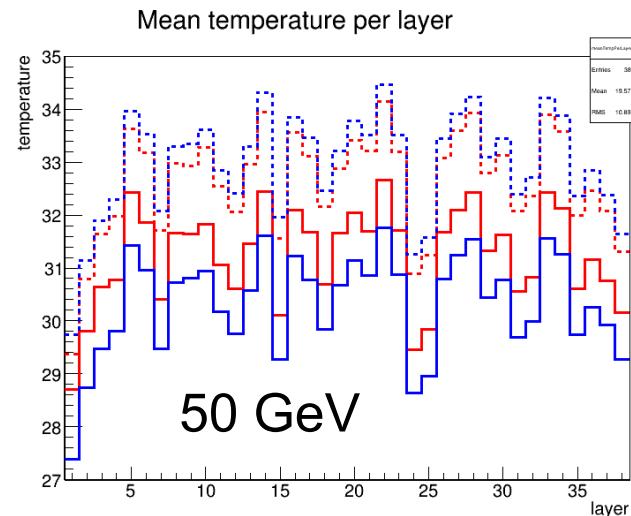
First Look into Temperature Data



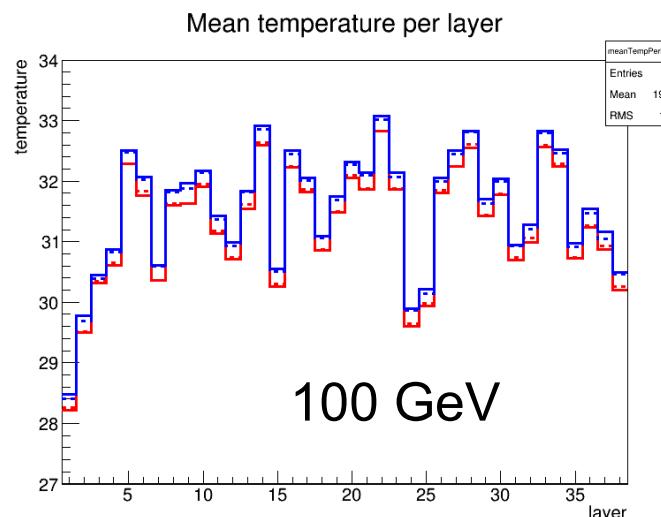
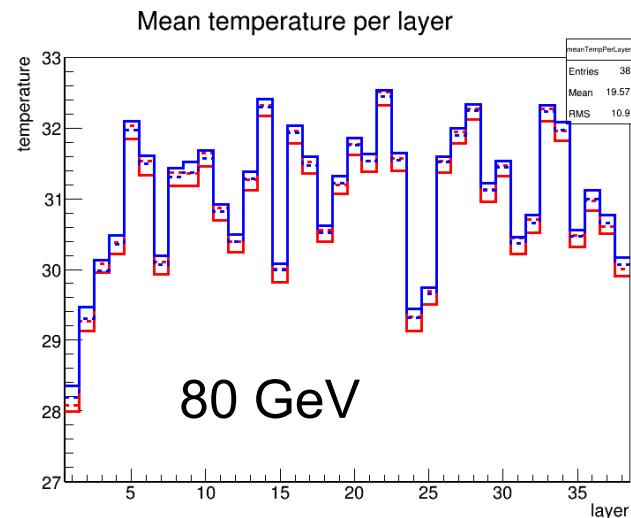
- - - NoPP, first temp
- NoPP, last temp
- - - PP, first temp
- PP, last temp



First Look into Temperature Data



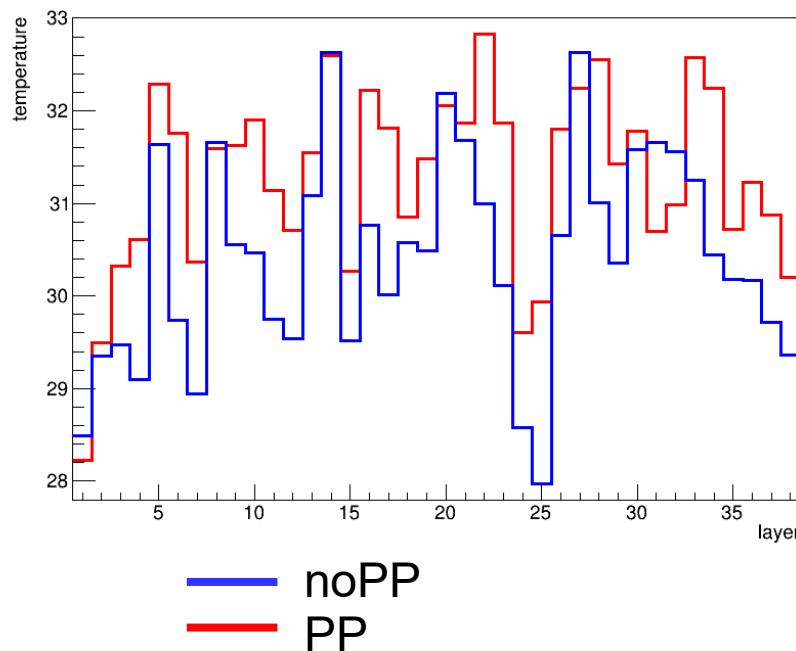
- NoPP, first temp
- NoPP, last temp
- PP, first temp
- PP, last temp



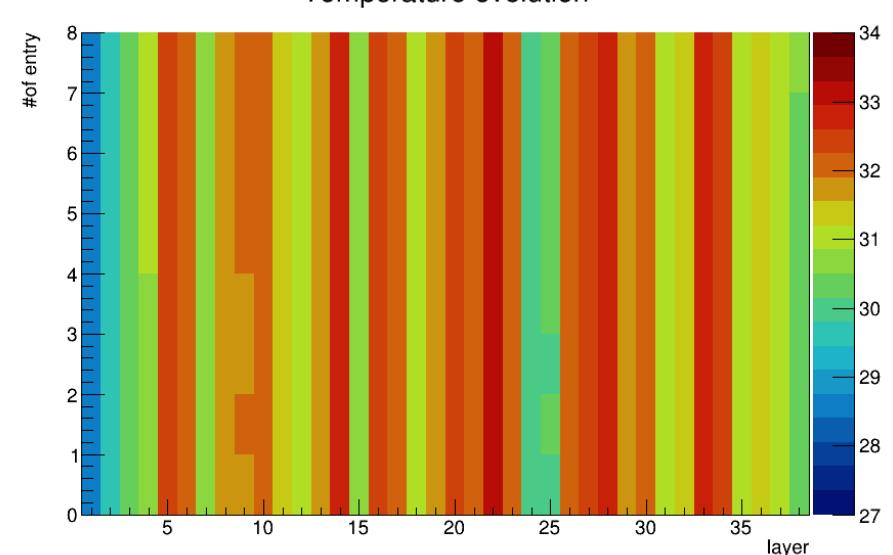
First Attempt of Offset Correction

- Baseline: First layer of first temperature measurement in June
- Sensorwise correction

Mean temperature per layer



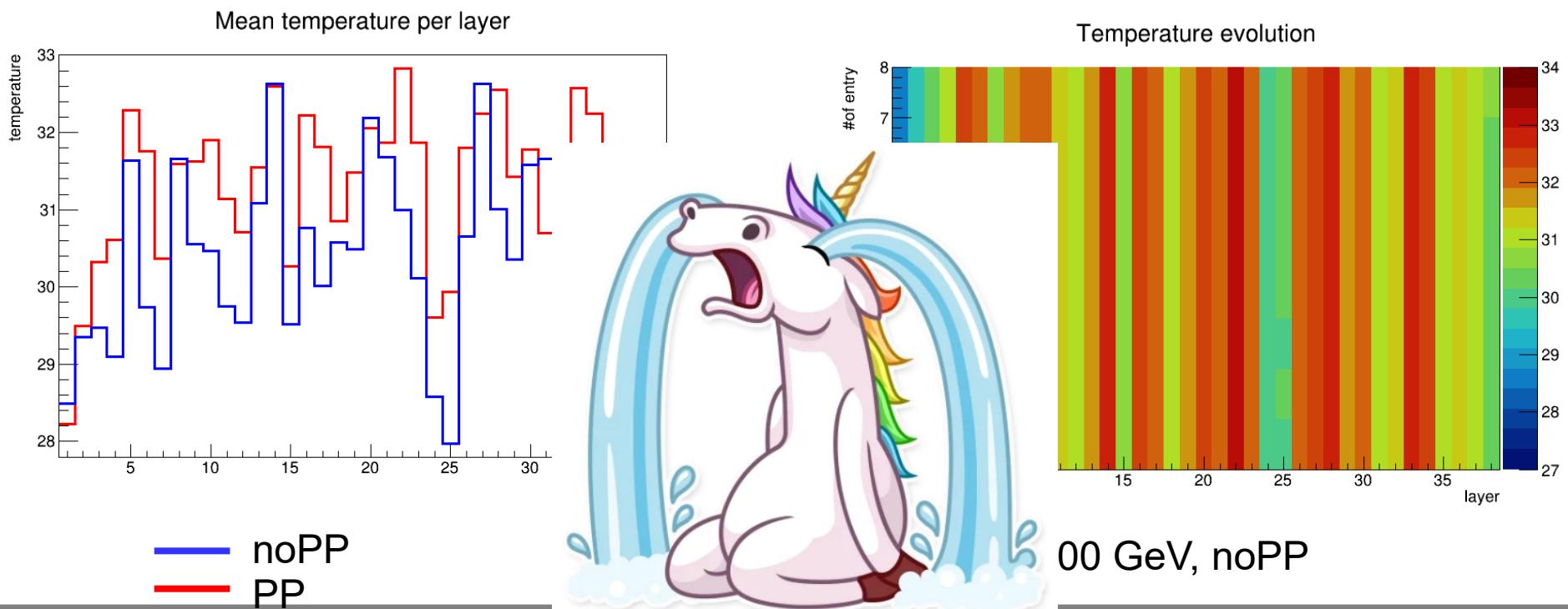
Temperature evolution



100 GeV, noPP

First Attempt of Offset Correction

- Baseline: First layer of first temperature measurement in June
- Sensorwise correction



Problem: TempRootTreeGenerator

- Generator to write temperature to root tree
- Reads temperature sensorwise from slcio file line by line
- Problem: Temperature data in slcio file sorted by LDA port number
- LDA port number \neq layer number!



Problem: TempRootTreeGenerator

```
# Serial      T1      T2      T3      T4      T5      T6      DIF      PWR
# LDA: 0Port: 1 303.00E+0    296.00E+0    297.00E+0    293.00E+0    293.00E+0    286.00E+0
# LDA: 0Port: 2 315.00E+0    307.00E+0    310.00E+0    302.00E+0    305.00E+0    291.00E+0
# LDA: 0Port: 3 1.04E+3 317.00E+0    1.04E+3 311.00E+0    316.00E+0    299.00E+0    30.00E+0
# LDA: 0Port: 4 324.00E+0    316.00E+0    318.00E+0    312.00E+0    312.00E+0    293.00E+0
# LDA: 0Port: 5 339.00E+0    331.00E+0    335.00E+0    326.00E+0    329.00E+0    307.00E+0
# LDA: 0Port: 6 334.00E+0    326.00E+0    328.00E+0    321.00E+0    321.00E+0    303.00E+0
# LDA: 0Port: 7 319.00E+0    312.00E+0    314.00E+0    306.00E+0    305.00E+0    287.00E+0
# LDA: 0Port: 8 330.00E+0    323.00E+0    324.00E+0    313.00E+0    317.00E+0    300.00E+0
# LDA: 0Port: 9 334.00E+0    325.00E+0    327.00E+0    321.00E+0    322.00E+0    304.00E+0
# LDA: 0Port:10 330.00E+0    322.00E+0    325.00E+0    319.00E+0    319.00E+0    302.00E+0
# LDA: 0Port:11 320.00E+0    314.00E+0    316.00E+0    310.00E+0    311.00E+0    295.00E+0
# LDA: 0Port:12 317.00E+0    312.00E+0    311.00E+0    305.00E+0    305.00E+0    287.00E+0
# LDA: 0Port:13 325.00E+0    317.00E+0    320.00E+0    313.00E+0    314.00E+0    299.00E+0
# LDA: 0Port:15 333.00E+0    329.00E+0    328.00E+0    323.00E+0    324.00E+0    306.00E+0
# LDA: 0Port:16 309.00E+0    304.00E+0    304.00E+0    301.00E+0    299.00E+0    285.00E+0
```

Data format in
slcio file

```
# Serial      T1      T2      T3      T4      T5      T6      DIF      PWR
# LDA: 0Port: 1 303.00E+0    296.00E+0    297.00E+0    293.00E+0    293.00E+0    286.00E+0
# LDA: 0Port: 2 315.00E+0    307.00E+0    310.00E+0    302.00E+0    305.00E+0    291.00E+0
# LDA: 0Port: 3 1.04E+3 317.00E+0    1.04E+3 311.00E+0    316.00E+0    299.00E+0    30.00E+0
# LDA: 0Port:24 324.00E+0    328.00E+0    327.00E+0    320.00E+0    322.00E+0    305.00E+0
# LDA: 0Port: 4 324.00E+0    316.00E+0    318.00E+0    312.00E+0    312.00E+0    293.00E+0
# LDA: 0Port: 5 339.00E+0    331.00E+0    335.00E+0    326.00E+0    329.00E+0    307.00E+0
# LDA: 0Port: 6 334.00E+0    326.00E+0    328.00E+0    321.00E+0    321.00E+0    303.00E+0
# LDA: 0Port: 7 319.00E+0    312.00E+0    314.00E+0    305.00E+0    305.00E+0    287.00E+0
# LDA: 0Port: 8 330.00E+0    323.00E+0    324.00E+0    317.00E+0    317.00E+0    300.00E+0
# LDA: 0Port:25 333.00E+0    328.00E+0    328.00E+0    322.00E+0    320.00E+0    304.00E+0
# LDA: 0Port: 9 334.00E+0    325.00E+0    327.00E+0    321.00E+0    322.00E+0    304.00E+0
# LDA: 0Port:10 330.00E+0    322.00E+0    325.00E+0    319.00E+0    319.00E+0    302.00E+0
# LDA: 0Port:11 320.00E+0    314.00E+0    316.00E+0    310.00E+0    311.00E+0    295.00E+0
# LDA: 0Port:12 317.00E+0    312.00E+0    311.00E+0    305.00E+0    305.00E+0    287.00E+0
# LDA: 0Port:13 325.00E+0    317.00E+0    320.00E+0    313.00E+0    314.00E+0    299.00E+0
```

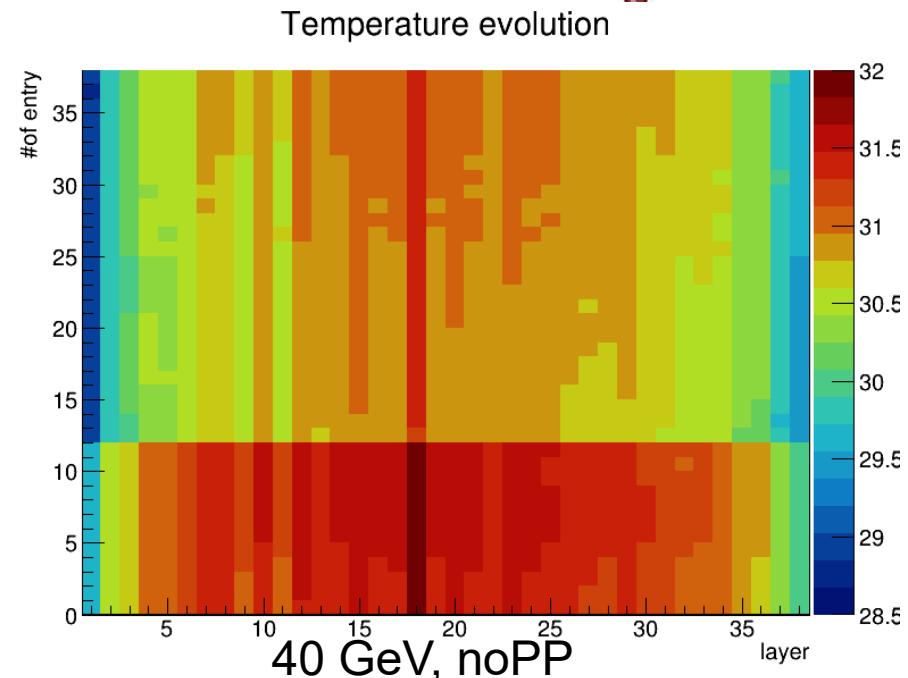
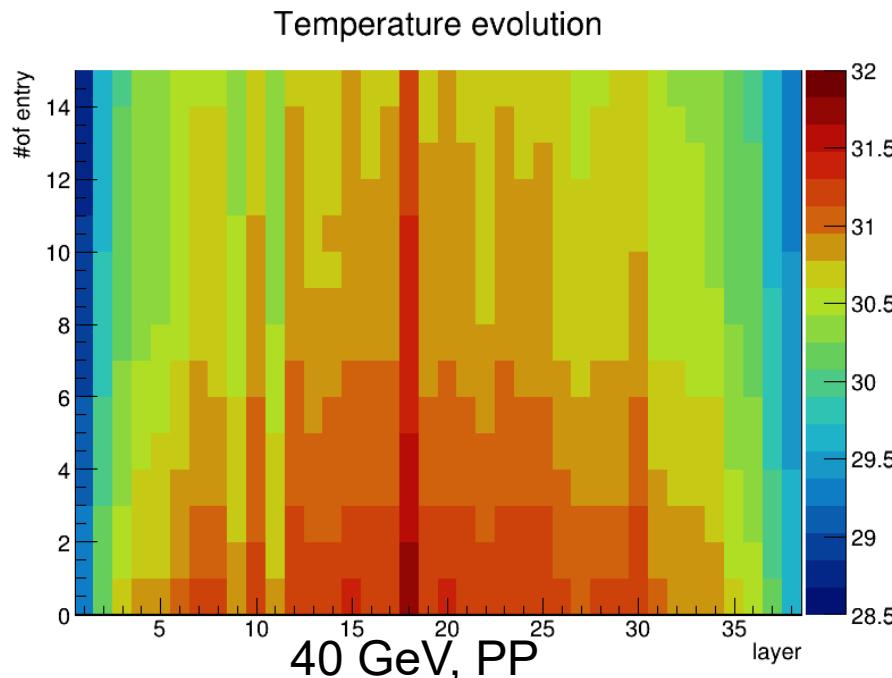
What it should
look like

Problem: TempRootTreeGenerator

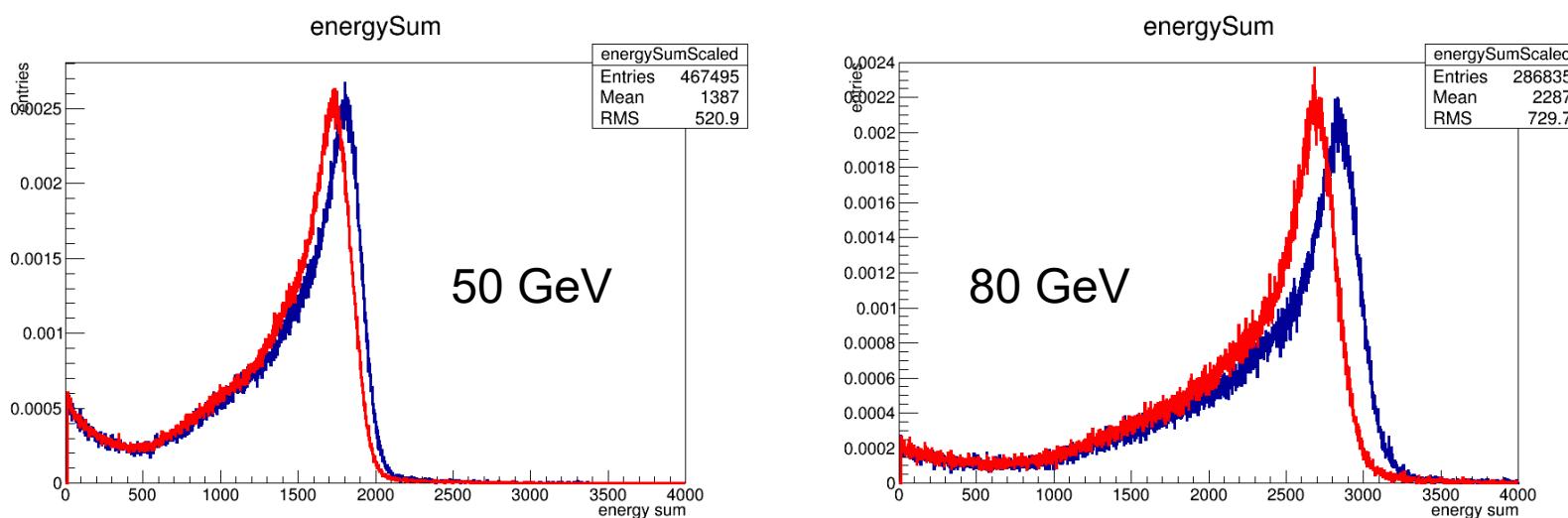
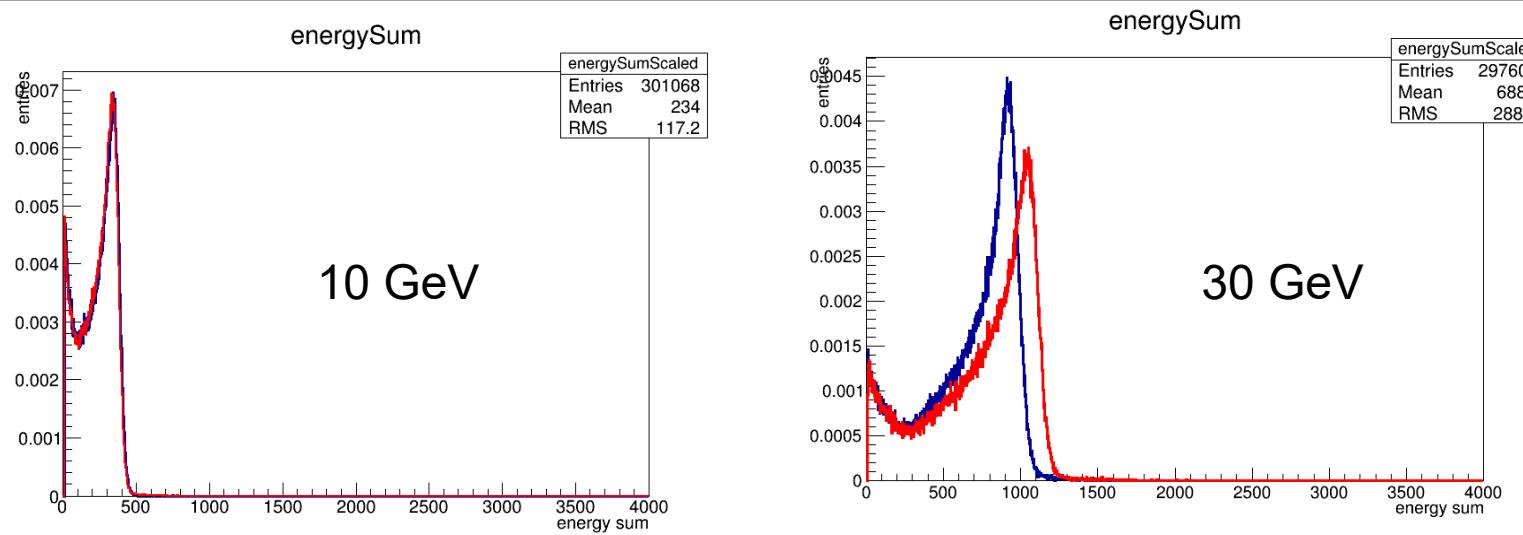
- TempRootTreeGenerator fills temperature data linewise with one line = one layer
- Problem 1: wrong order of layers
- Problem 2: some port numbers missing
 - ⇒ Mapping not only from LDA port number to layer number but from position in table to line number
 - ⇒ Different mapping files for May and June needed
- Mapping implemented in RootTreeGenerator

New temperatures

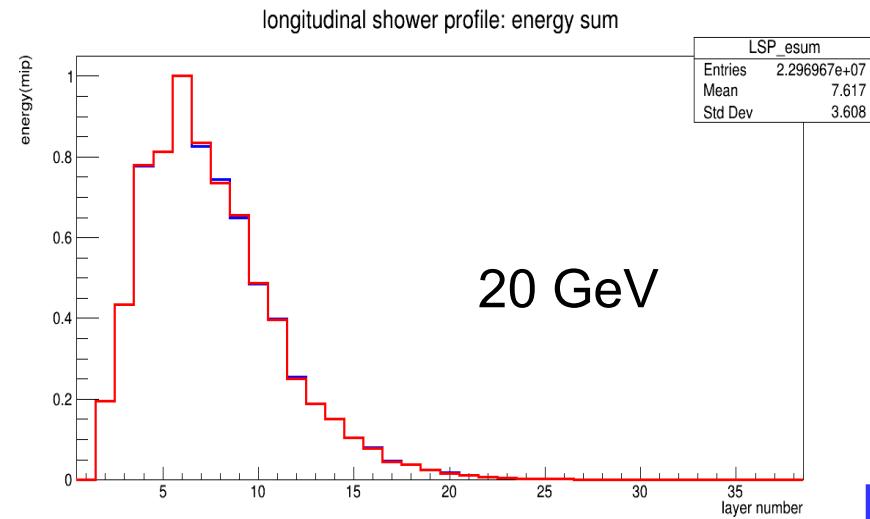
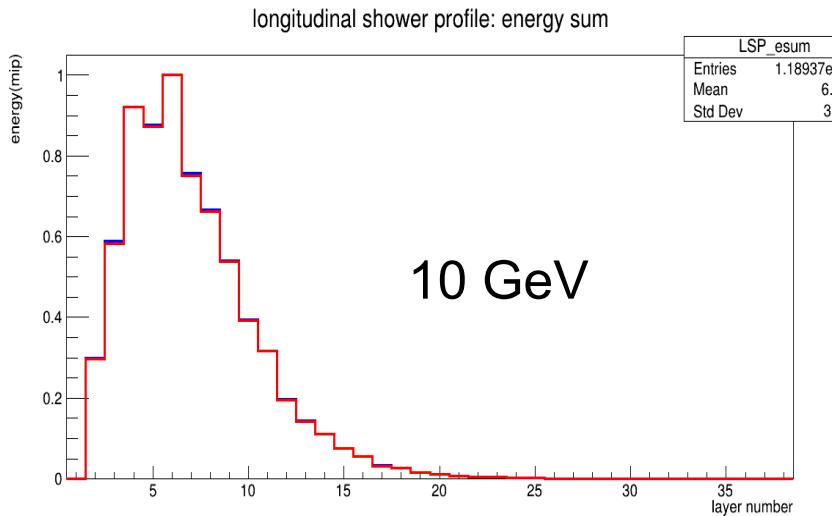
- Offset correction working
- Cooling for PP, heating for noPP



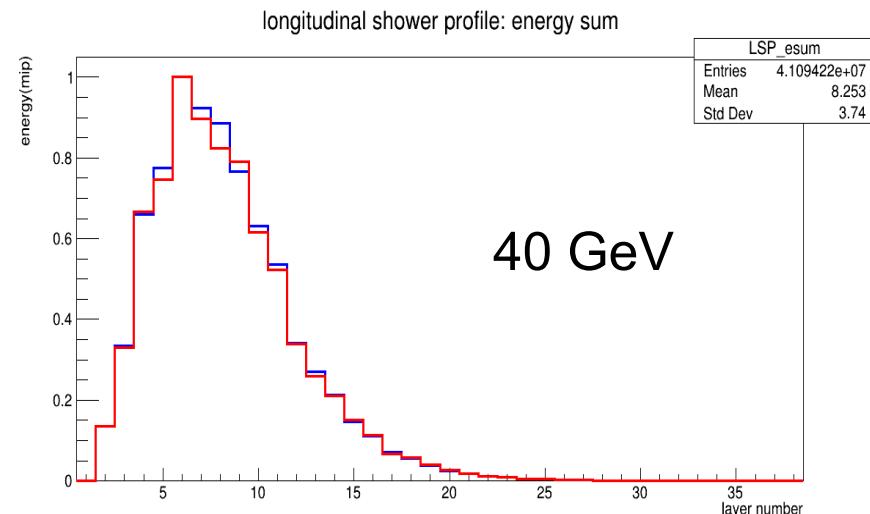
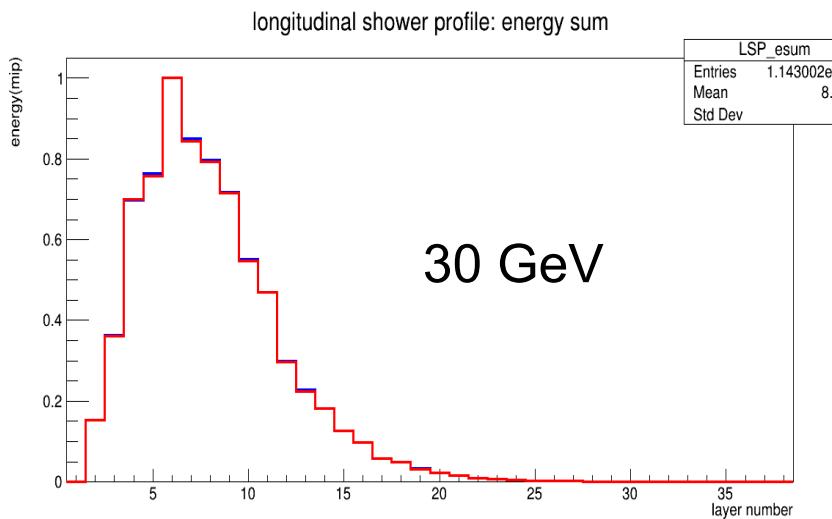
Reminder: Energy Sum



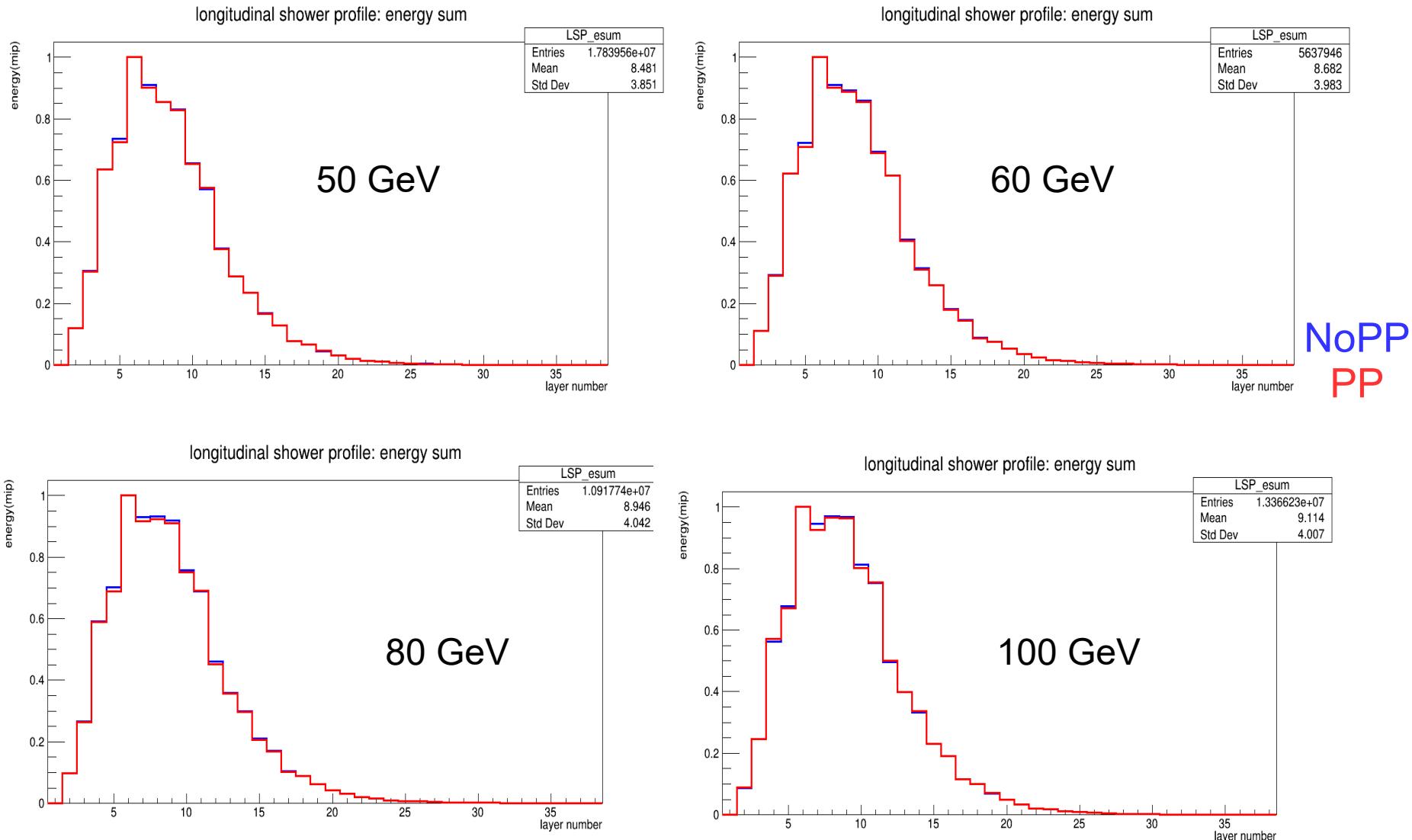
Longitudinal Shower Profile - Esum



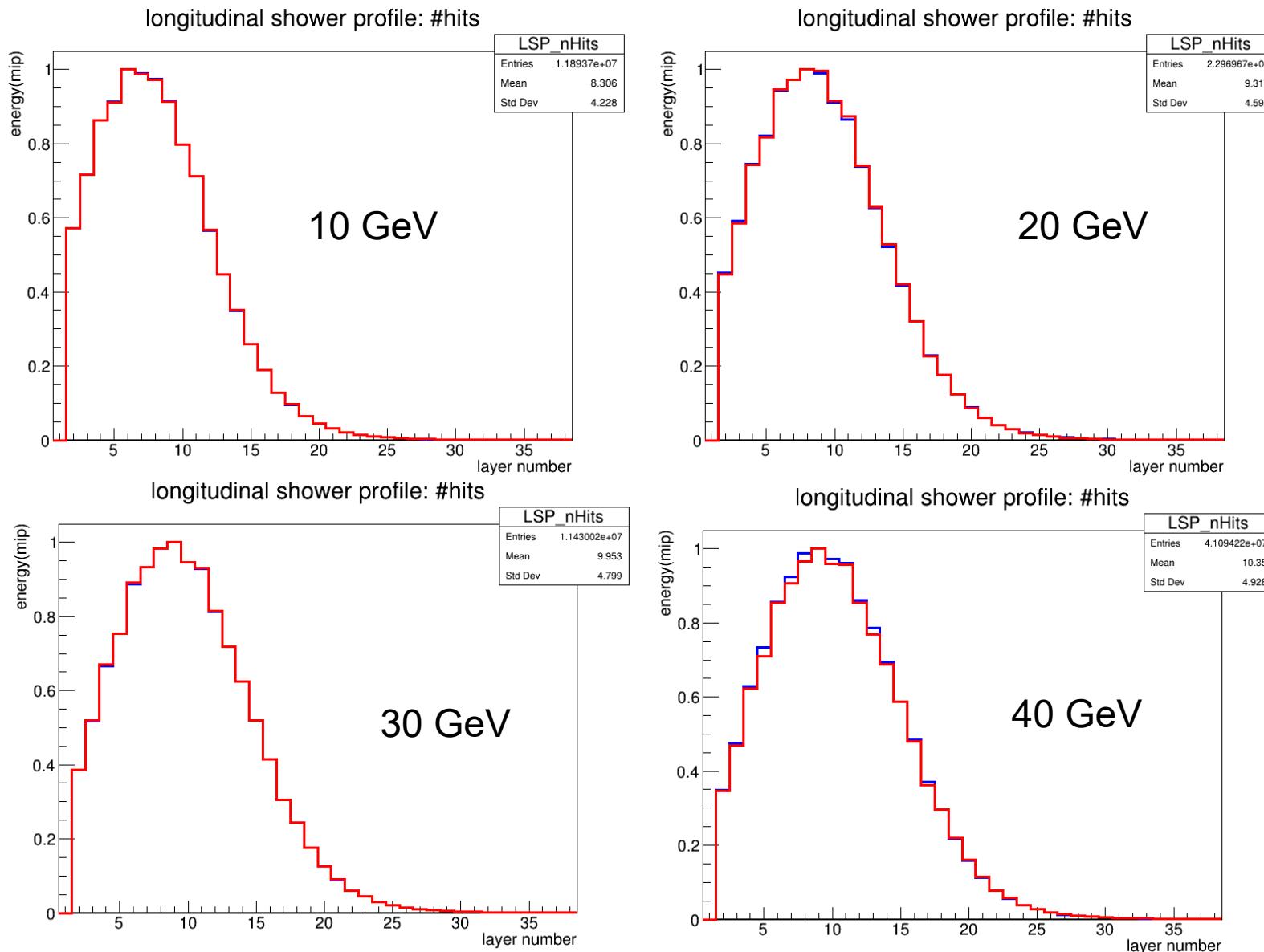
NoPP
PP



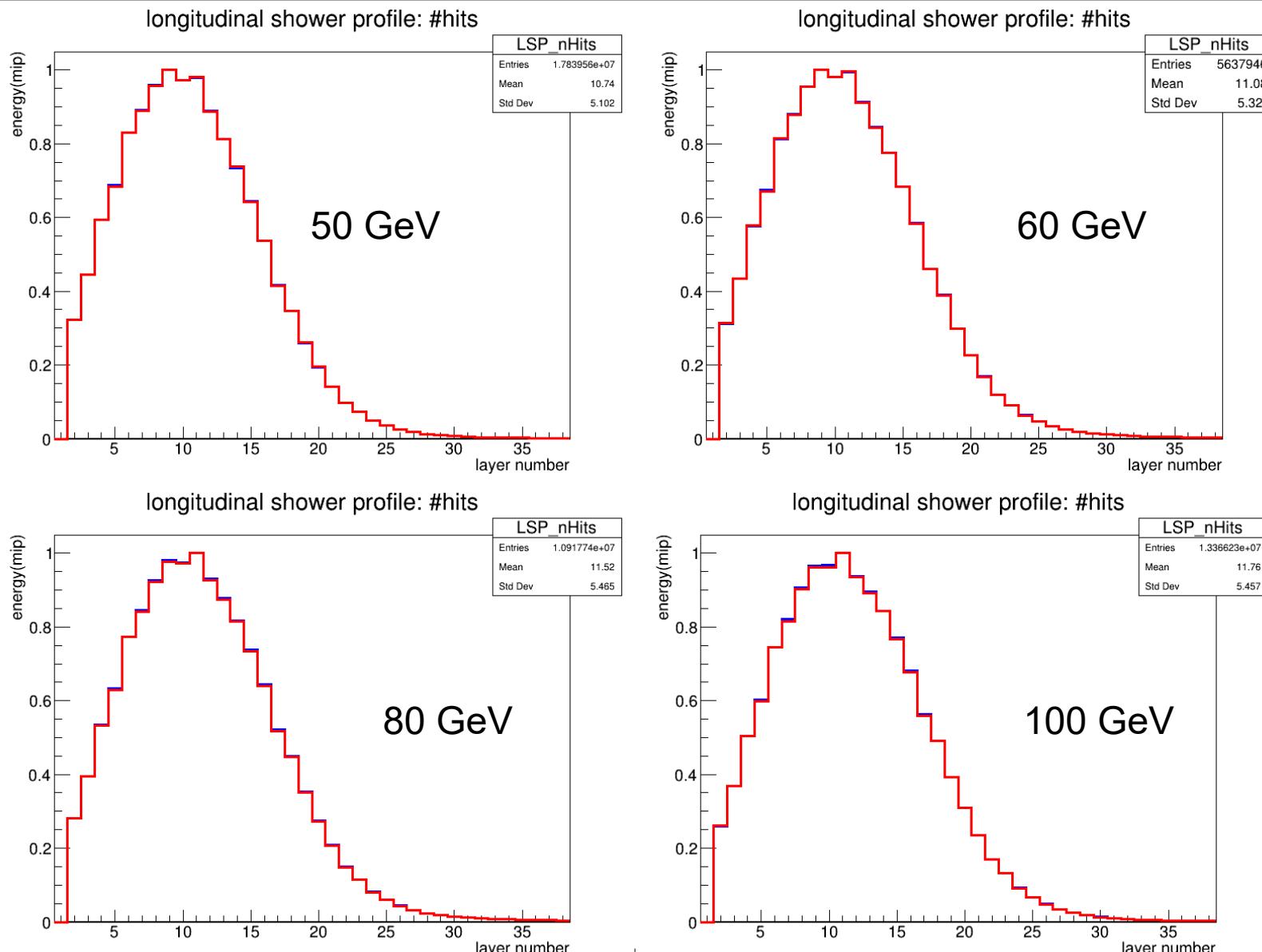
Longitudinal Shower Profile - Esum



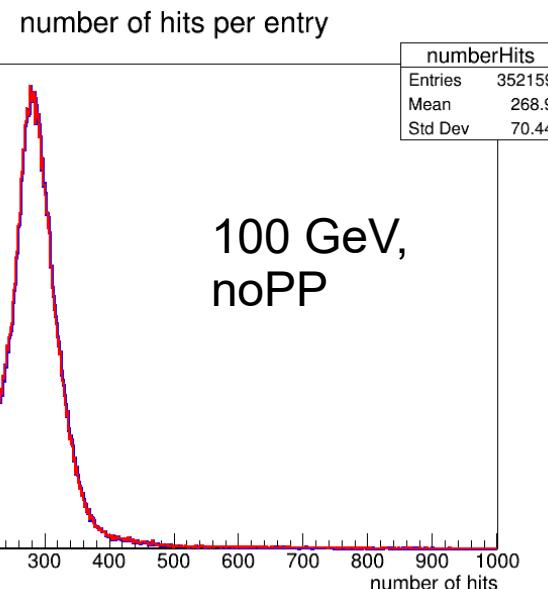
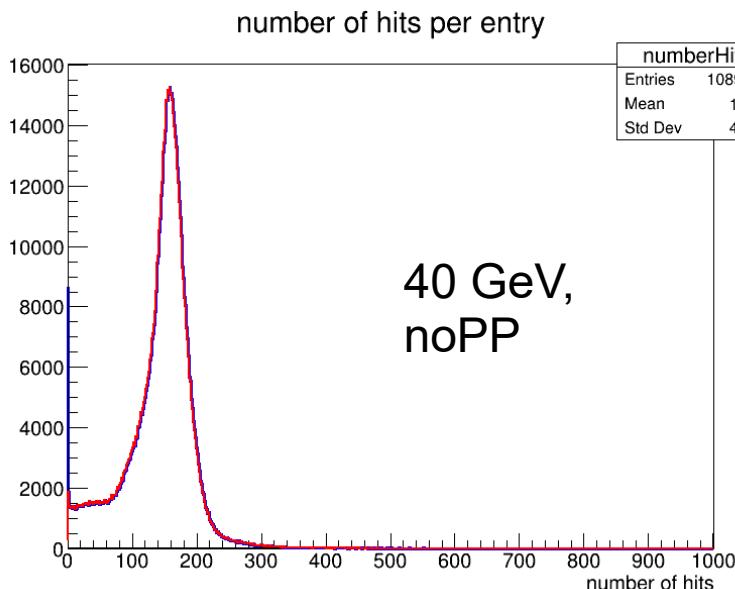
Longitudinal Shower Profile - Nhits



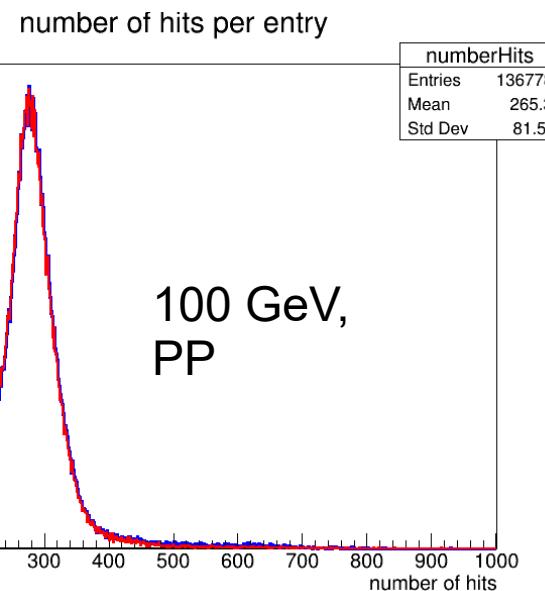
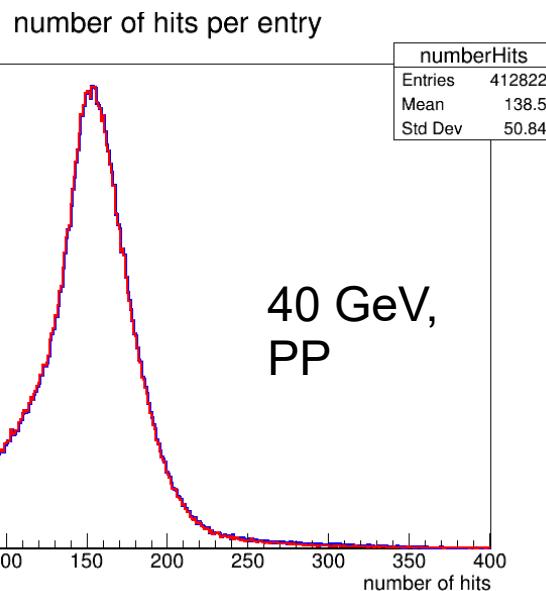
Longitudinal Shower Profile - Nhits



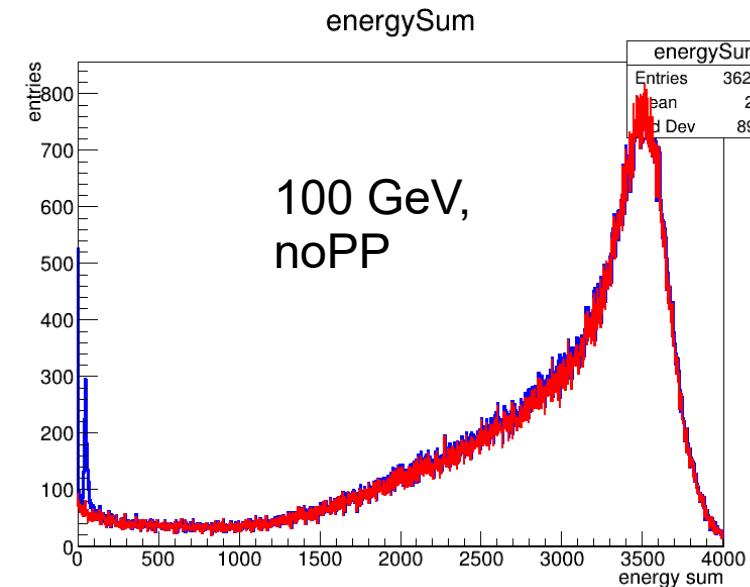
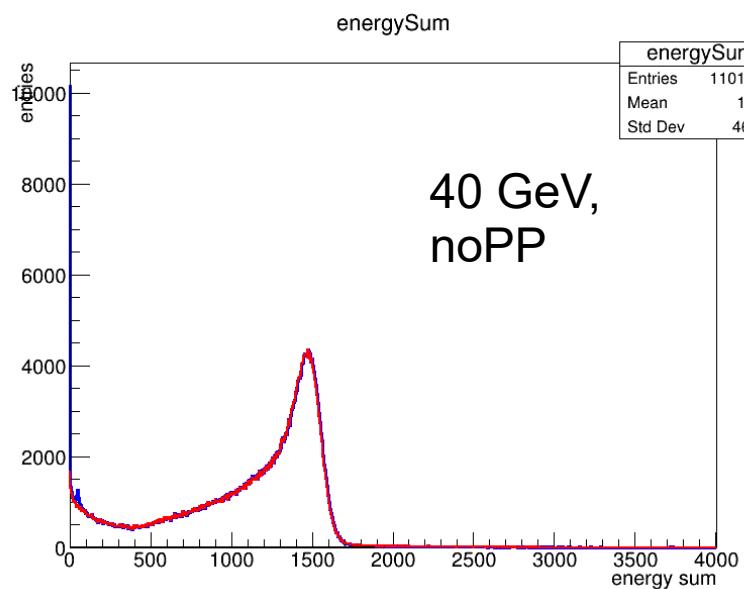
Compare Nhits



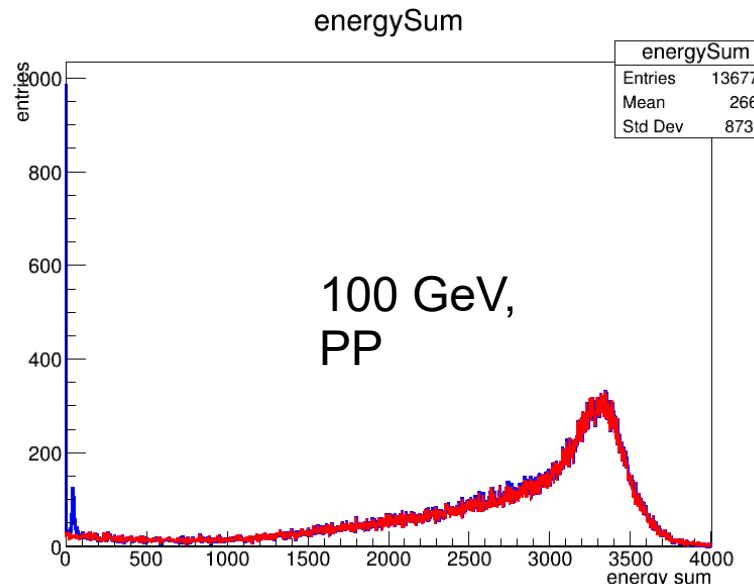
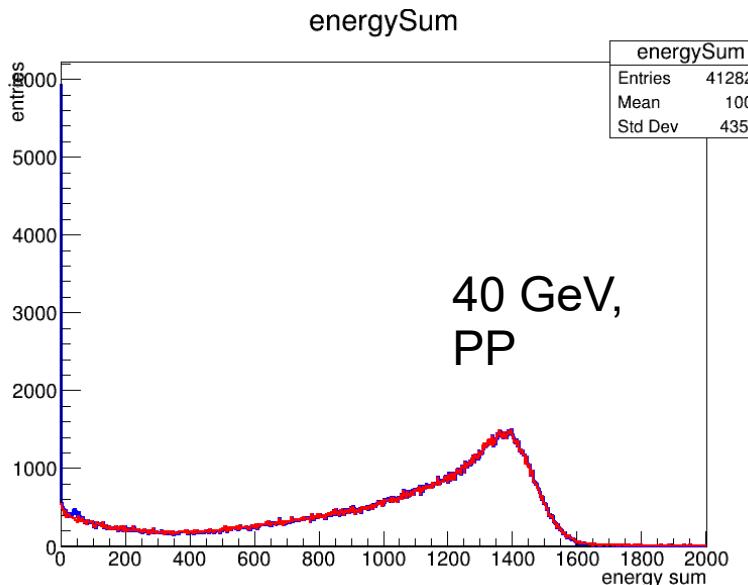
RootTree
Sum over LSP



Compare Esum



RootTree
Sum over LSP



Summary and Outlook

- Error in TempRootTreeGenerator found and corrected
- Temperature Profiles successfully created
- First look in LSP; looks fine
- To do:
 - Compare LSP layer + channelwise
 - Understand differences in energy sum

