

CKF update

Miriam Künzle

Belle II tracking meeting, 31/8/18

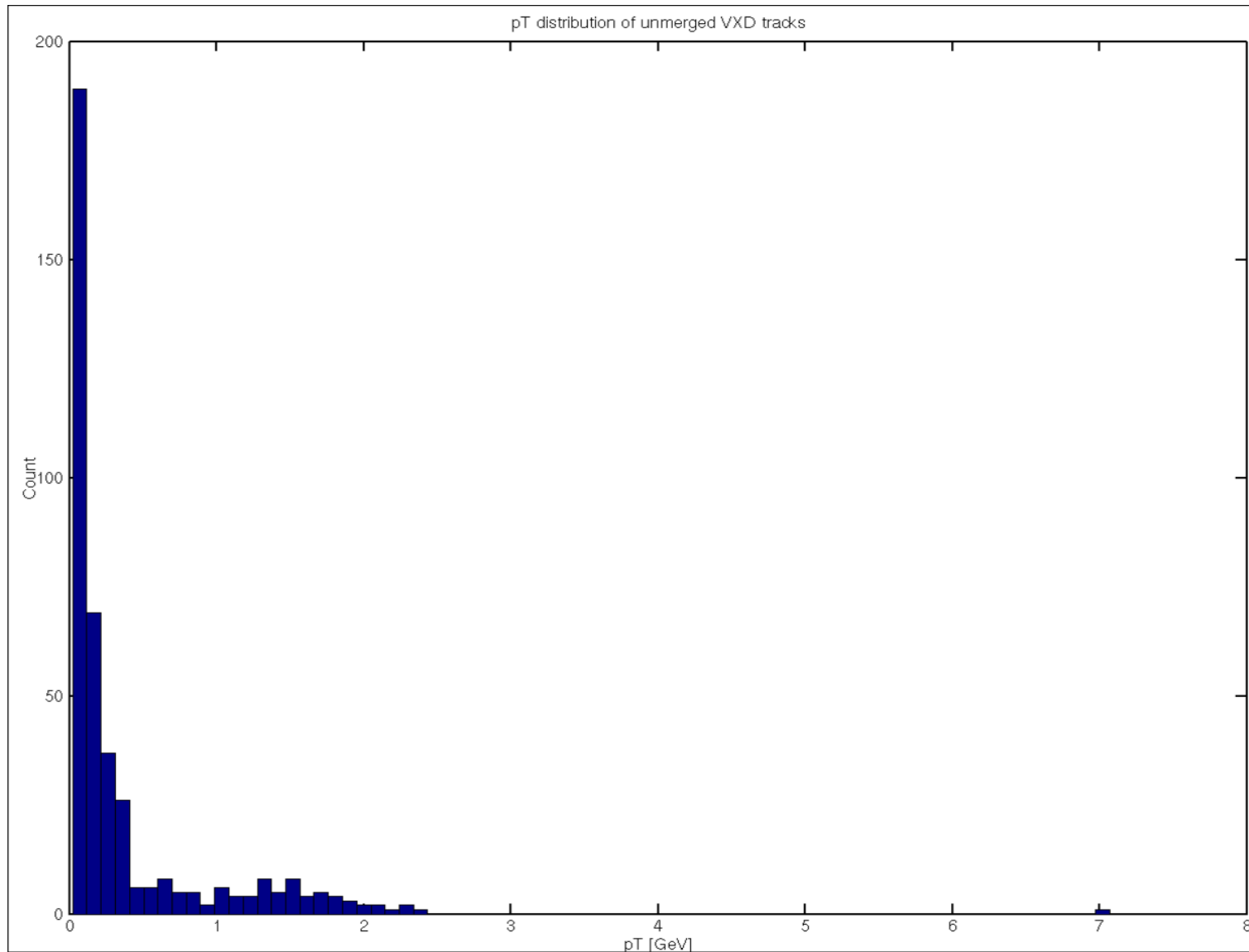
The weight file naming convention

- The .xml weight files have the following name convention:

`pdg_[PID]_range_[momentum range #]_filter_[filter #].xml`

- PID={11,13,-11,-13} (What to use for BB events?)
- Filter # = {1,2,3}
- Momentum range # = {1,2,3,4,5}
- By the end of the week, there will be **60 MVA weight files in total**

The unmerged VXD track pT distribution



First efficiency comparisons I: 1000 muon events + bkg, cut: 0.00001

	Track finding [%]	Hit finding [%]	Clone rate [%]	Fake rate [%]
Muon weight files Range 1 ... Range 5	93.7	62.07	0.21	9.71
	93.5	62.61	0.21	9.47
	93.3	62.08	0.32	10.09
	93.7	62.66	0.43	9.78
	93.4	62.73	0.32	9.82
Electron weight files Range 1 ... Range 5	93.2	62.49	0.21	10.19
	93.4	62.49	0.21	9.82
	93.6	62.78	0.32	9.88
	93.2	62.58	0.32	10.35
	93.2	62.75	0.21	10.02

First efficiency comparisons I: 1000 muon events + bkg, cut: 0.00001

	Track finding [%]	Hit finding [%]	Clone rate [%]	Fake rate [%]
Anti-Muon weight files Range 1 ... Range 5	87.8	58.60	0.23	15.38
	88.6	59.93	0.23	15.35
	91.2	61.50	0.22	12.37
	92.6	61.77	0.43	11.68
	91.1	61.39	0.33	12.62
Anti-Electron weight files Range 1 ... Range 5	88.0	59.82	0.11	15.45
	90.5	61.20	0.22	13.04
	87.3	59.10	0.34	16.09
	91.4	61.23	0.33	12.33
	90.9	61.86	0.22	13.07

First efficiency comparisons I: 1000 muon events + bkg, cut: 0.0001

	Track finding [%]	Hit finding [%]	Clone rate [%]	Fake rate [%]
Muon weight files Range 1 ... Range 5	93.7	61.96	0.21	9.45
	93.8	62.54	0.21	8.91
	93.5	61.98	0.32	9.55
	93.9	62.63	0.32	9.16
	93.6	62.60	0.21	9.11
Electron weight files Range 1 ... Range 5	93.4	62.45	0.21	9.57
	93.8	62.42	0.42	9.34
	93.8	62.77	0.32	9.52
	93.5	62.53	0.43	9.54
	93.4	62.77	0.21	9.39

First efficiency comparisons I: 1000 muon events + bkg, cut: 0.0001

	Track finding [%]	Hit finding [%]	Clone rate [%]	Fake rate [%]
Anti-Muon weight files Range 1 ... Range 5	87.8	58.46	0.23	14.89
	88.5	59.82	0.11	14.89
	91.3	61.39	0.22	12.19
	92.6	61.77	0.32	11.35
	91.2	61.34	0.22	12.20
Anti-Electron weight files Range 1 ... Range 5	88.2	59.78	0.11	15.10
	90.5	61.08	0.33	12.52
	87.5	58.95	0.34	15.74
	91.3	61.24	0.33	12.34
	90.9	61.86	0.22	12.99

First efficiency comparisons I: 1000 muon events + bkg, cut: 0.001

	Track finding [%]	Hit finding [%]	Clone rate [%]	Fake rate [%]
Muon weight files Range 1 ... Range 5	93.7	61.15	0.11	8.13
	94.1	60.96	0	7.93
	93.6	61.13	0	8.77
	94.4	61.39	0	7.99
	93.9	61.55	0	8.57
Electron weight files Range 1 ... Range 5	93.6	62.07	0.11	8.85
	94.1	61.57	0.11	8.28
	94.4	61.92	0.21	8.51
	93.7	61.94	0.11	9.02
	94	61.88	0.11	8.55

First efficiency comparisons I: 1000 muon events + bkg, cut: 0.001

	Track finding [%]	Hit finding [%]	Clone rate [%]	Fake rate [%]
Anti-Muon weight files Range 1 ... Range 5	87.7	57.76	0.11	14.42
	88.7	59.08	0	13.72
	91.5	60.75	0.22	10.88
	92.6	61.40	0.22	10.51
	91.5	61.18	0.22	11.49
Anti-Electron weight files Range 1 ... Range 5	88.6	59.43	0.11	14.46
	90.6	60.83	0.11	12.20
	87.8	58.23	0.23	14.81
	91.6	61.01	0.33	11.63
	90.9	61.75	0.22	12.82

First efficiency comparisons I: 1000 muon events + bkg, cut: 0.01

	Track finding [%]	Hit finding [%]	Clone rate [%]	Fake rate [%]
Muon weight files Range 1 ... Range 5	78.7	51.03	0	8.70
	88.5	48.66	0	10.61
	89.2	50.54	0	11.42
	90.4	51.67	0	10.50
	89.5	51.16	0	11.47
Electron weight files Range 1 ... Range 5	88.3	48.41	0	12.57
	90.2	50.35	0	11.05
	90.5	52.52	0	10.75
	89.1	49.08	0	11.69
	90.04	52.42	0	11.29

First efficiency comparisons I: 1000 muon events + bkg, cut: 0.01

	Track finding [%]	Hit finding [%]	Clone rate [%]	Fake rate [%]
Anti-Muon weight files Range 1 ... Range 5	73.7	46.27	0	9.79
	79.5	49.64	0	10.77
	89.2	53.79	0	11.86
	91.2	55.86	0	9.79
	88.1	53.40	0	13.03
Anti-Electron weight files Range 1 ... Range 5	87.8	50.16	0	13.50
	88.4	52.24	0	12.99
	86.4	49.29	0	14.62
	88.5	51.78	0	12.72
	89.2	53.93	0	12.46

Let the merging continue

- In tracking/ckf/scripts/path_utils.py, I defined the following functions: **add_cdc_ckf** and **_add_cdc_ckf_implementation**
- In the steering file, it can then be called using

```
from ckf.path_functions import *  
...  
add_cdc_ckf(path, vxd_reco_tracks="...",  
output_cdc_reco_tracks="...")
```

- It has been successfully added to the add_track_finding function, more information to come :-)

What's to come?

- Fine-tune the MVA cut value?
- Make the `_add_cdc_ckf_implementation` function more complex
- Calculate efficiencies for electron events