ORCA4 analysis (very quick) status

Still reproducing Jannik analysis, though …
And sorry for the bad slides ...

Valentin Pestel - 11/09/2020

Cuts list from Jannik analysis

- dz>0 (upgoing)
- tot_max_trighit<240 (anti-spark)
- n_doms_cher_cond>=5 (#DOMs with signal-like hits, |tres|<15ns)
- n_trig_doms_cher_cond>=3 (#DOMs with signal-like triggered hits)
- nhits>=20 (#hits used in Gandalf, against pure-noise & for quality)
- Qup/nhits>2.0 (‘likelihood per hit’)
- Qup/nhits>5-0.045*Qup (fine-tuning against pure-noise)
- Qup-Qdn>40 (Gandalf: best up MINUS best down solution)
- ntrighits_offtime_early<=3 (not too many early triggered hits, tres<-15ns)

Signal-like hits on up/down facing PMTs:

- ntrighits_chercond_downFacing - ntrighits_chercond_upFacing>=0
- ntrighits_chercond_downFacing>=5
- nhits_chercond_downFacing-nhits_chercond_upFacing>=10

Containment :

- d_closest_approach<20m (infinite track)
- rtrk<35m (reco vertex radial position)
- (ztrighit-lowest_dom_z>25. || (rtrk<20. && ztrighit-lowest_dom_z>15.)

Results

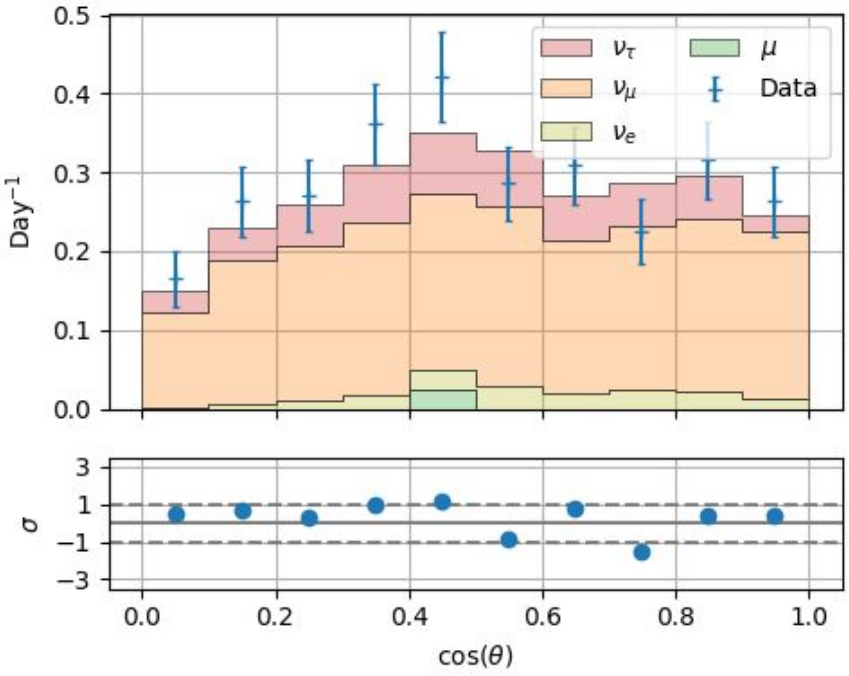
383 events in 132.96 days (376 for Jannik).

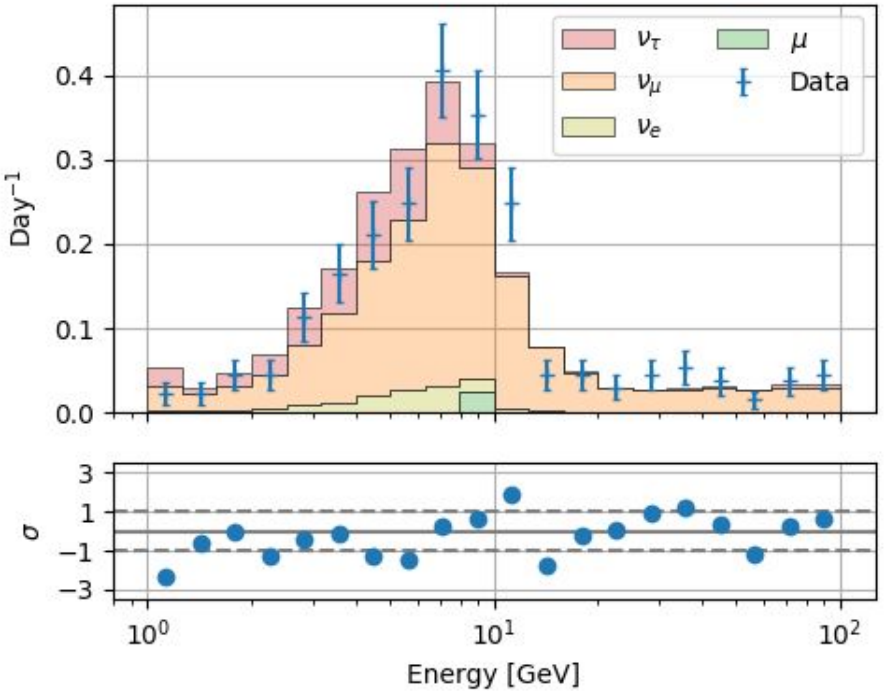
- Still exploring the disagreements
- Also disagreements with Lodewijk
    - Is Lodewijk in agreement with Jannik ?

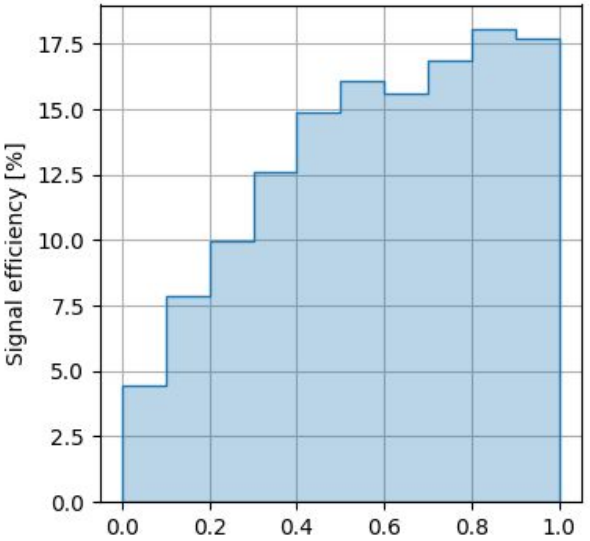
296 between [1:100] GeV range

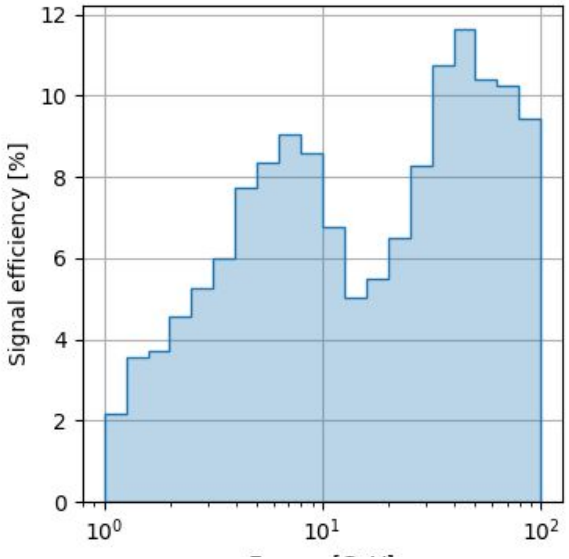
- The one use for the analysis fit by Lodewijk

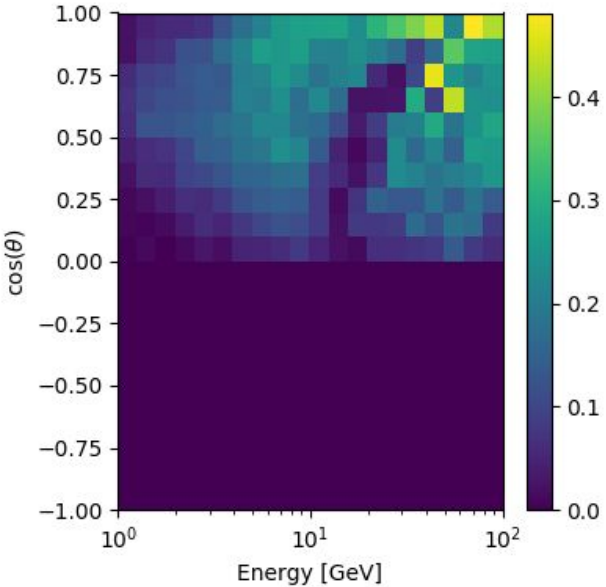
Energy and cos(theta) distribution

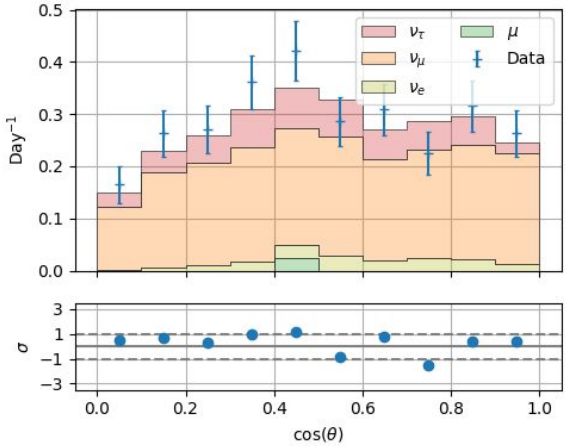


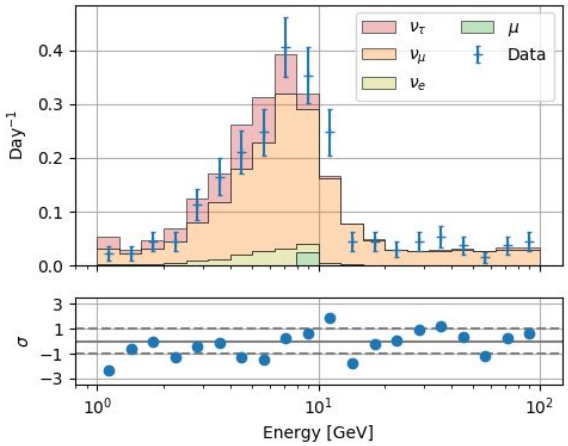



Signal efficiency [%]
0.0
2.5
5.0
7.5
10.0
12.5
15.0
17.5
0.0
0.2
0.4
0.6
0.8
1.0

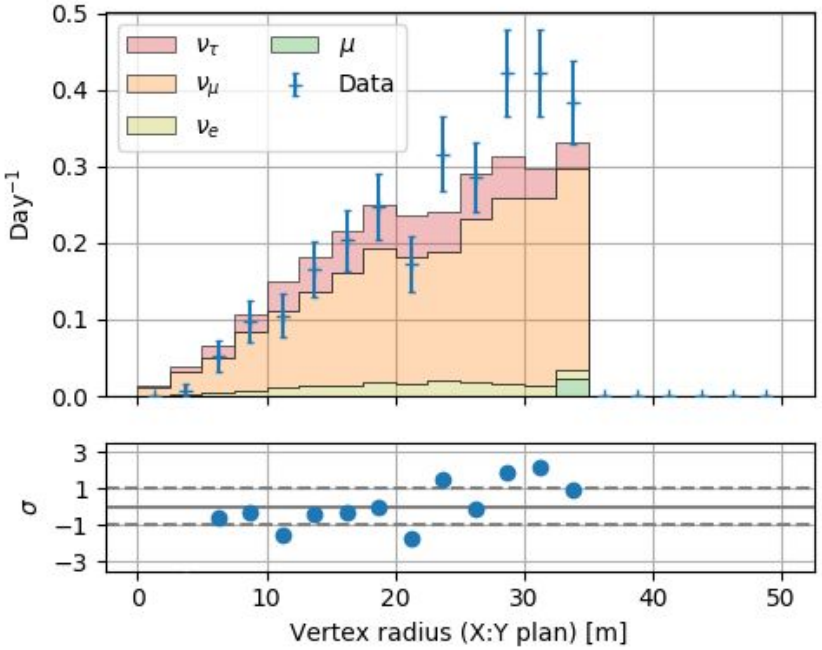

Signal efficiency [%]
0
2
4
6
8
10
12
10^0
10^1
10^2

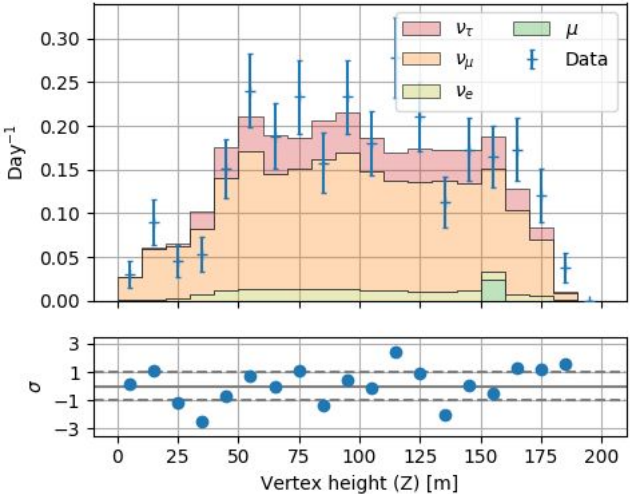

cos(θ)
1.00
0.75
0.50
0.25
0.00
−0.25
−0.50
−0.75
−1.00
10^0
10^1
10^2
Energy [GeV]
0.0
0.1
0.2
0.3
0.4

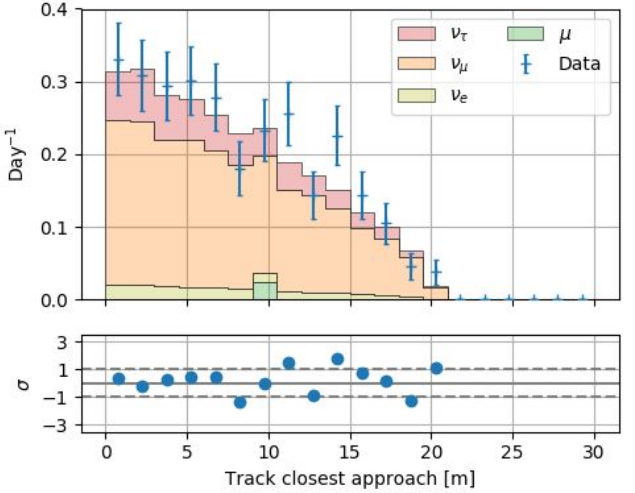

Day⁻¹
ν_τ
ν_μ
ν_e
μ
Data
0.0
0.1
0.2
0.3
0.4
0.5
σ
3
1
−1
−3
0.0
0.2
0.4
0.6
0.8
1.0
cos(θ)


Day⁻¹
ν_τ
ν_μ
ν_e
μ
Data
0.0
0.1
0.2
0.3
0.4
σ
3
1
−1
−3
10^0
10^1
10^2
Energy [GeV]

Track position







Rate per runs

383 events in 132.96 days

All the run are roughly the same duration (~6h):

- Event /run should follow a poisson law with mu = 0.69
- Pretty close