

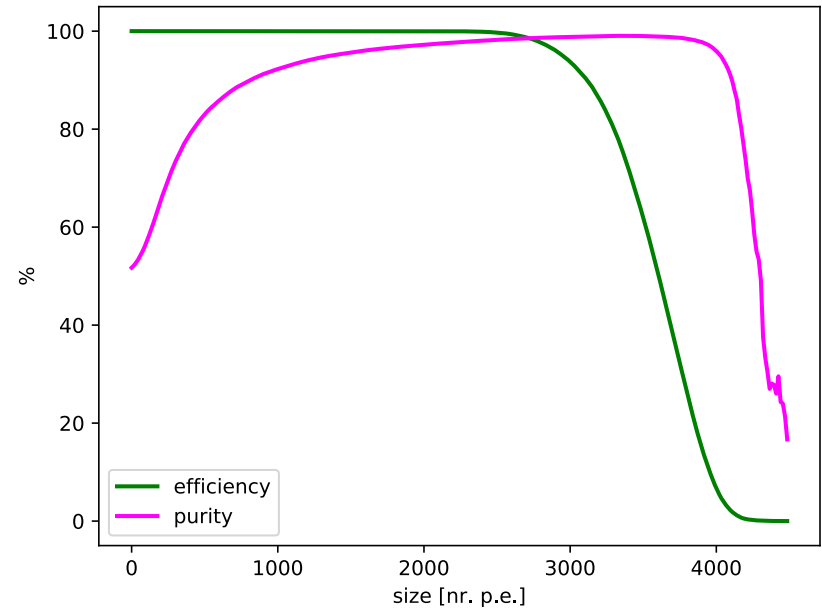
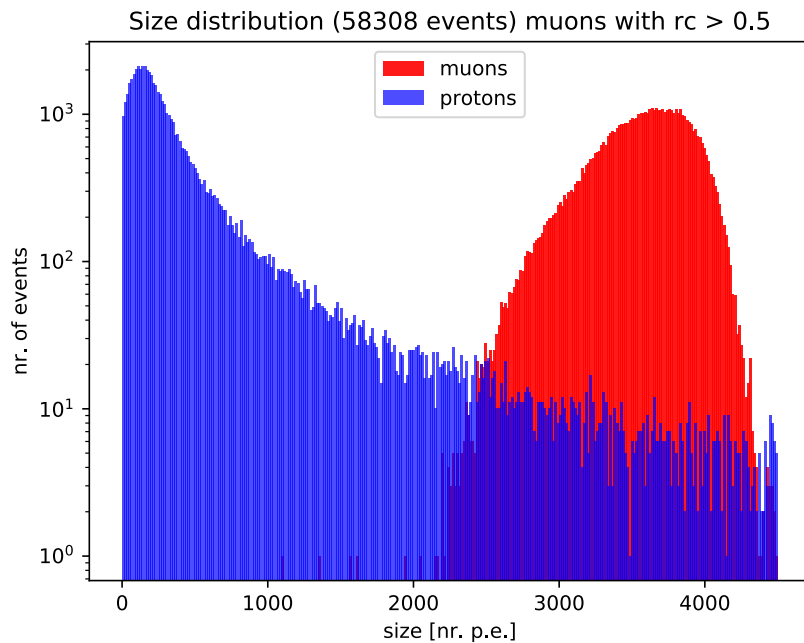
Fast muon tagging for LST1

Updates

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Recap



energy scaling of the proton size
distribution ongoing

Computation speed test: tag&fit

Tests performed on dedicated LST mono MC production

Muon search with preselection procedure:

preselection(@3500pe) + fit

Speed with energy scaling

```
time = np.hstack(time)
energy = np.hstack(energy)
weights = pow(energy/en_scale, -2.7 - ((-2.0)))
t = np.average(time, weights=weights)
f = 1./t
```

wanted index simulated index

← scaling

```
#PARAMETERS
en_scale = 0.1 #TeV
```

Results

Number of events: 1369837

Average time = (1.8169203327061605 +/- 0.04624813233862202) msec

Average frequency = (0.5503818643003342 +/- 1.1969830009164228e-05) kHz

Computation speed test: Muon tagging

Muon search with only preselection procedure:

Speed with energy scaling

Results

cut @ 3500pe

Number of events: 1369837

Average time = (0.03647102143031558 +/- 0.0005150461097036142) msec

Average frequency = (27.419029157455302 +/- 0.00033083832370707907) kHz*

cut @ 2500pe

Number of events: 1217009

Average time = (0.03639453105319041 +/- 0.0005458576863989872) msec

Average frequency = (27.476655724413796 +/- 0.0003735599249733307) kHz*

What to do next & open questions

- Tagging online with calibrated data?
 - Implement function with tagging -> (optimize existing code)
 - what should it return? simple boolean flag, add new member in data container?
 - ctapipe or lst_chain?

Ongoing:

- study performance vs. threshold