IC77 Single Corsika
2100 Hz for all triggers
1450 Hz for IC59 Nch-based muon trigger

Applying the same filter cuts as in IC59 for IC77:
~51 Hz, ~20 GB/day
(files have higher compression than last year)

Compare to 35.2 Hz, 15.6 GB/day the IC59 muon filter actually used from TFT page
IC59 Muon Filter Cuts:
Energy (total charge) for downgoing
Track quality cut for upgoing events

IC59 Muon Filter Selection

IC40 PS Cuts
Entries: 17777
Mean x: 80.67
Mean y: 2.742
RMS x: 36.43
RMS y: 0.9863
Zenith > 90

In the upgoing region the track quality cut does an excellent job of cutting out misreconstructed events early on.
Plogl cut is flat in Zenith > 80

Coincident_Corsika

Single_Corsika
85 > Zenith > 80

Signal vs Background Eff for log10(QTot) starting from (Zone 2.1)

- Dotted Blue - Misreconstructed Single Corsika
- Solid Blue - Well-reconstructed Single Corsika
- Red - Coincident Corsika
- Green - Atmospheric nu_munu
- Violet - E^2 nu_munu

<table>
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<th>htemp</th>
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<th>RMS</th>
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<td>27351</td>
<td>8.685</td>
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85 > Zenith > 80

Dotted Blue - Misreconstructed Single Corsika
Solid Blue - Well-reconstructed Single Corsika
Red - Coincident Corsika
Green - Atmospheric nu_munu
Violet - E^-2 nu_munu
80 > Zenith > 75

Dotted Blue - Misreconstructed Single Corsika
Solid Blue - Well-reconstructed Single Corsika
Red - Coincident Corsika
Green - Atmospheric nu\_mu
Violet - E^-2 nu\_mu
Moving farther into the downgoing region
The well-reconstructed corsika is quickly
>4 orders of magnitude above the atmospheric Neutrino flux.
In more strongly downgoing region the well-reconstructed down-going events completely dominate neutrinos.
Proposed Filter Cuts

Zenith > 80 : spePlogl < 8.1
75 > Zenith > 80 : speRlogl < 9
75 > Zenith > 70 : log10(QTot) > 1.8
70 > Zenith > 60 : log10(QTot) > 2.2
60 > Zenith > 50 : log10(QTot) > 2.5
0 > Zenith > 50 : log10(QTot) > 2.7
Rates!

Overall rate: 37.1 Hz

Efficiencies:
- 65% atm Nu
- 79% E^-2 Nu
- \langle 29.5 \text{ NCh} \rangle

14.67 GB/d
<table>
<thead>
<tr>
<th>Zone</th>
<th>SingMu (Hz)</th>
<th>DoubMu (Hz)</th>
<th>AtmEff (%)</th>
<th>SigEff (%)</th>
<th>GB/Day</th>
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<td>0.34</td>
<td>0.35</td>
<td>24.5</td>
<td>3.24</td>
</tr>
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</table>
Quick study on CPU loading

We use
LineFit Zenith >= 70 && Nch >= 8
or
LineFit Zenith < 70 && Nch >= 10
As the criterion to do a Gulliver fit

I tested changing the downgoing criteria to:
LineFit Zenith < 70 && Nch >= 14
This criteria cuts out ~33% of the downgoing single Corsika, and removes ~1.5% of upgoing atmospheric neutrinos. Doing the gulliver fit on these events is still important for other filters, like DST.
To do:

Continue putting the proposal together
(have IC59 proposal as a template)

Calculate #CPUs required
Compare IC59 sim/data rates

Collect feedback?