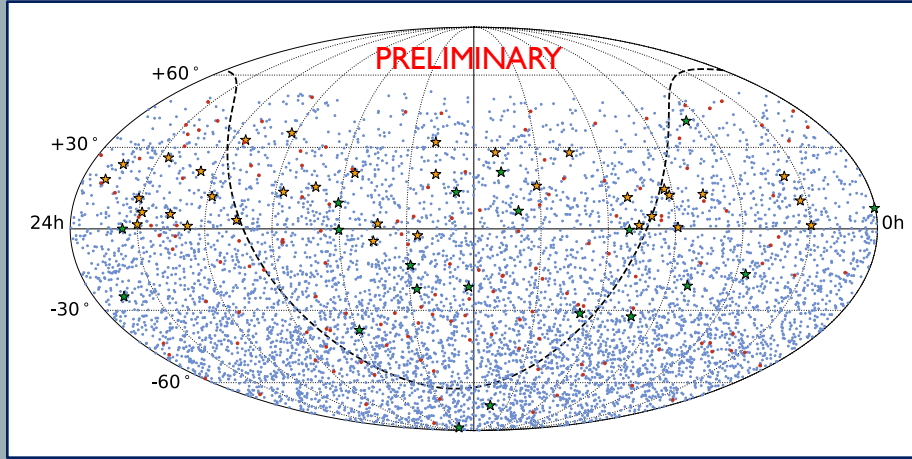


Search for time and space correlations between ANTARES data and IceCube high energy neutrino events – SEARCH METHOD

Candidates:

54 IceCube high energy neutrino events

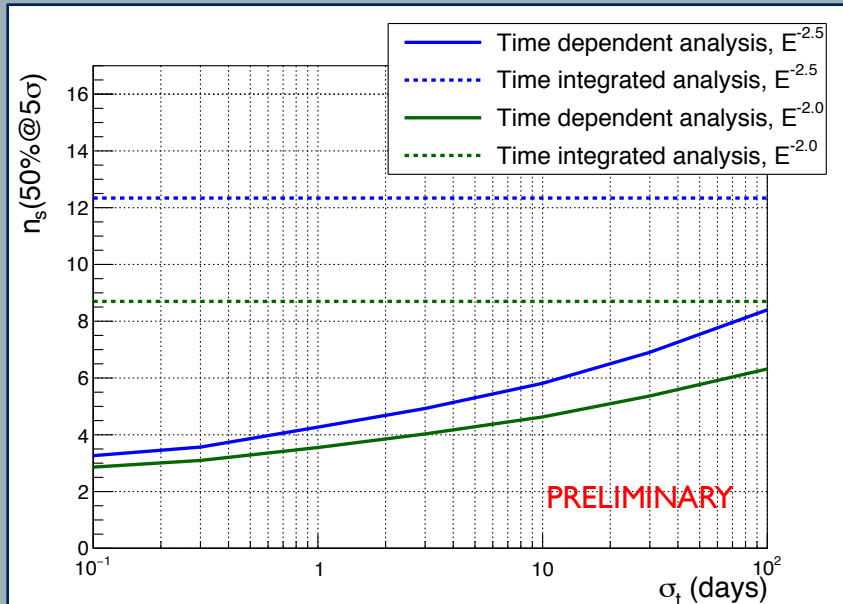
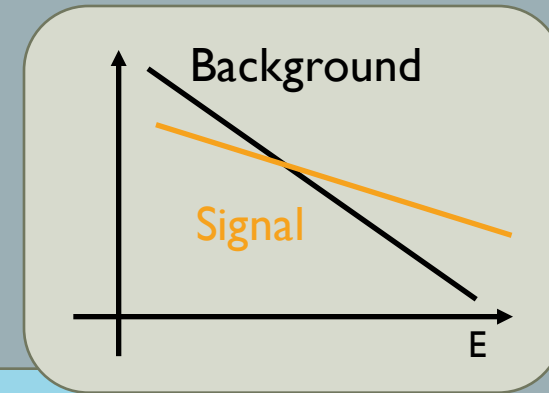
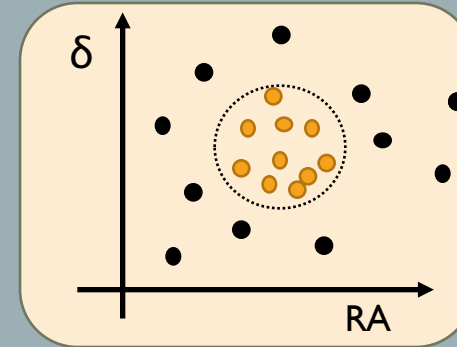
ANTARES data sample:
6310 tracks
147 cascades



Maximum likelihood method

$$\log L_{s+b} = \sum_j \sum_{i \in j} \log [\mu_{sig}^j S_i^j + N^j B_i^j] - \mu_{sig}$$

$$PDF = p_{space} \cdot p_{energy} \cdot p_{time}$$



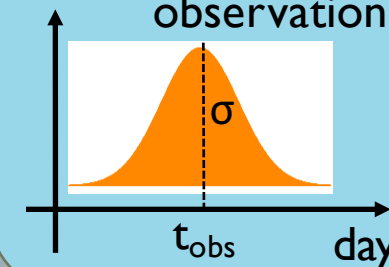
Four free parameters:

- number of signal events
- signal spectral index
- flare duration
- source position

σ = flare duration

t_{obs} = source

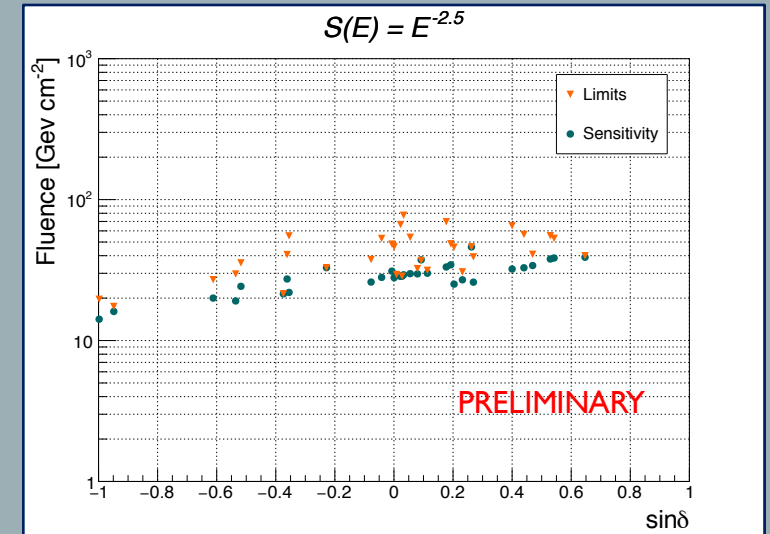
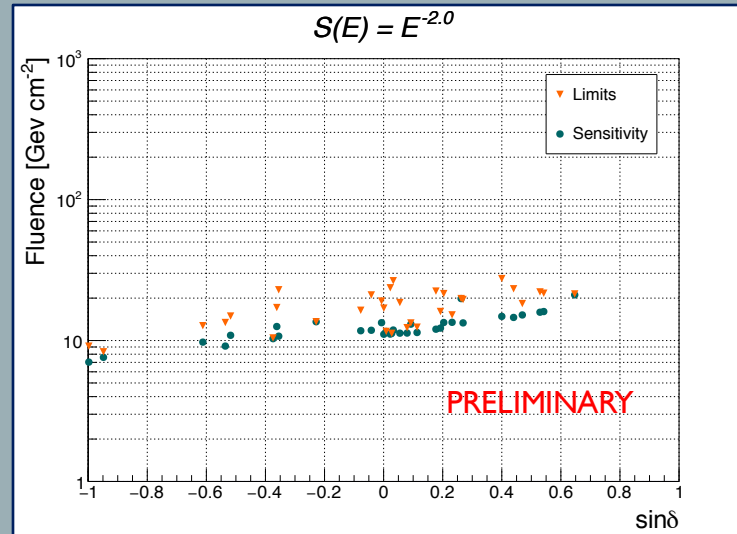
observation time



Search for time and space correlations between ANTARES data and IceCube high energy neutrino events – RESULTS

No correlation with IceCube events observed.
90% C.L. upper limits on fluence:

HESE ID	$\hat{\sigma}_t[days]$	HESE ID	$\hat{\sigma}_t[days]$
3	≥ 120	44	≥ 120
5	≥ 120	45	66.3
8	≥ 120	53	≥ 120
13	≥ 120	58	18.5
23	≥ 120	63	66.6
28	≥ 120	71	≥ 120
43	25.9		



EHE ID	$\hat{\sigma}_t[days]$	EHE ID	$\hat{\sigma}_t[days]$
2	≥ 120	18	≥ 120
3	≥ 120	19	≥ 120
6	≥ 120	22	87.2
7	≥ 120	23	≥ 120
8	≥ 120	24	20.1
9	≥ 120	26	≥ 120
10	25.9	28	≥ 120
14	81.1	30	113.9
15	≥ 120	32	≥ 120
17	≥ 120	35	≥ 120

90% C.L. upper limit on the
number of signal events expected
to be observed by IceCube

$$N_{IC}^{90\%} = \int \Phi_{0,\gamma}^{UL} \times A_{eff}^{IC} \times E^{-\gamma} dE$$

