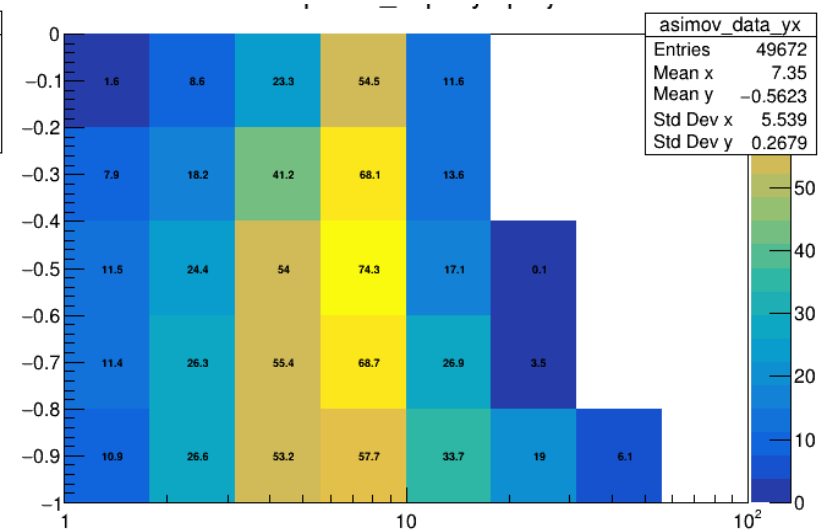
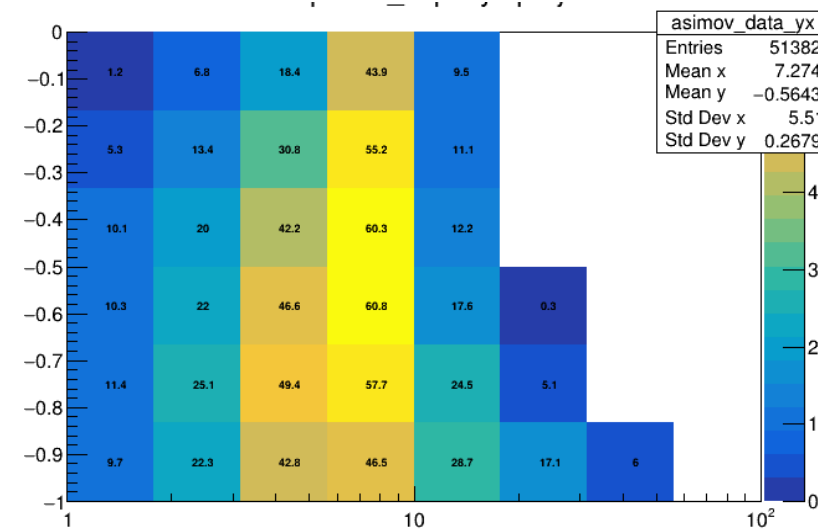
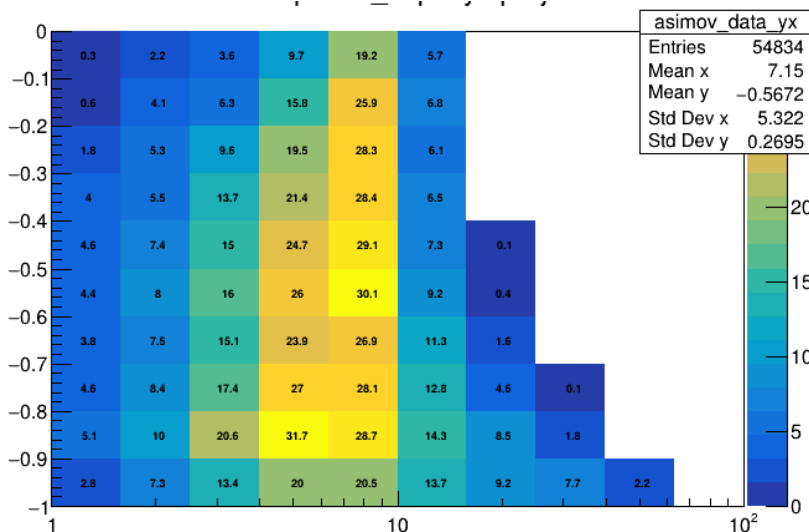
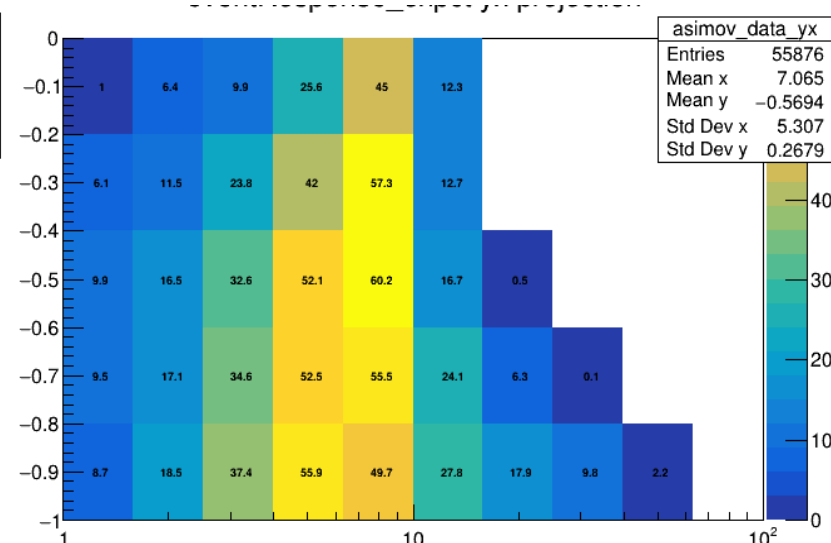
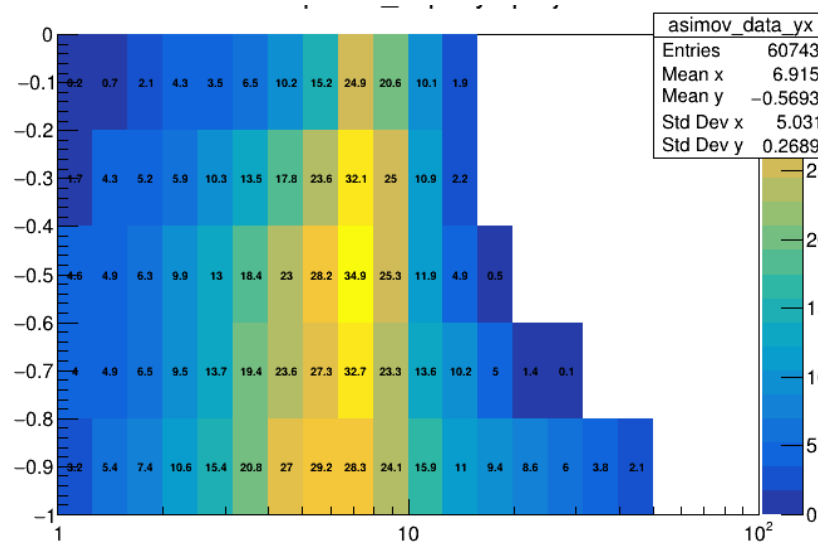
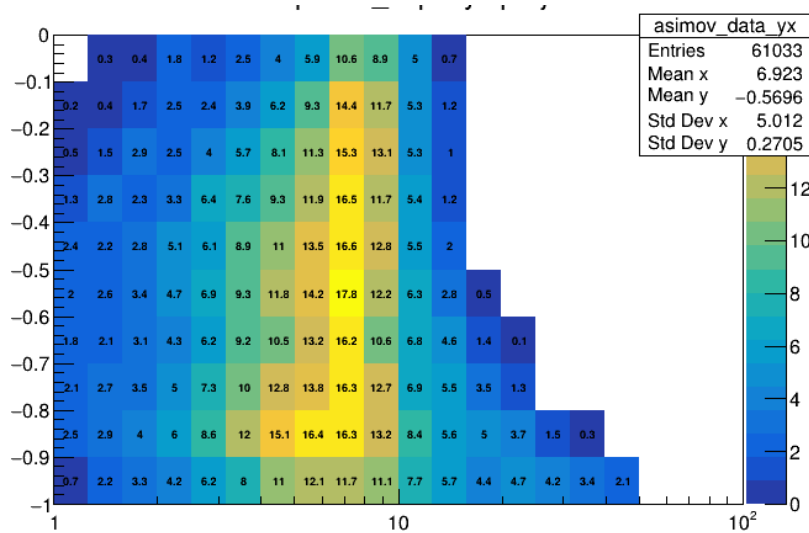
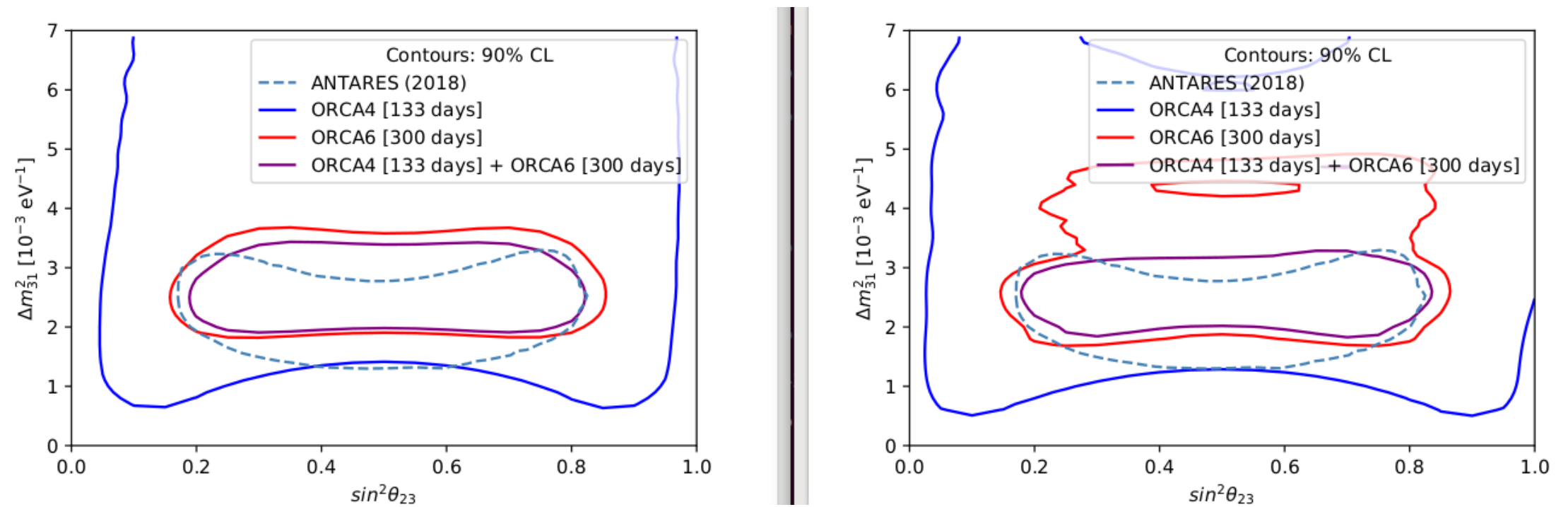


Binning for ICRC



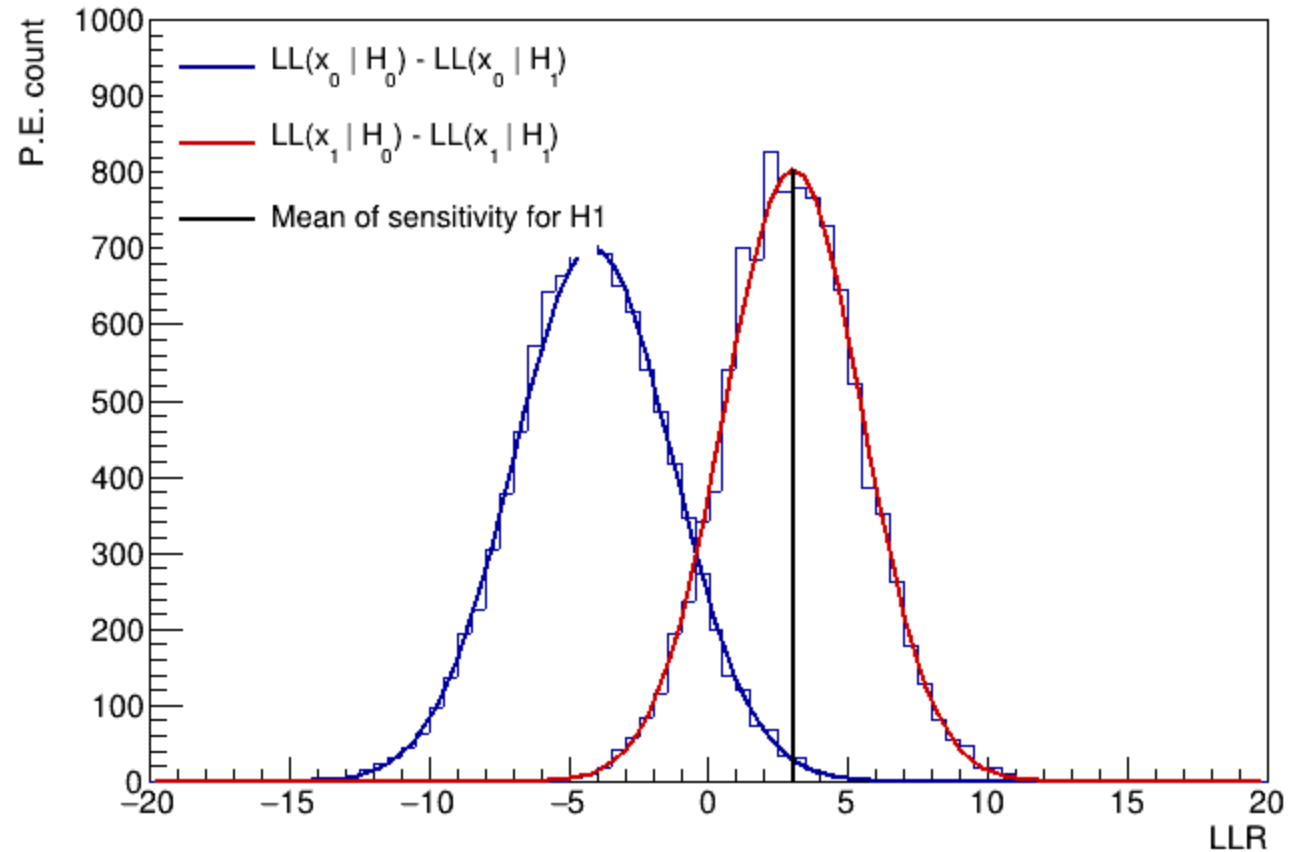
ICRC Contours ORCA4/6

Left binning: 30x20, Right binning: 15x10



ICRC LLR

Simplified LLR: $th_{12}=th_{13}=0$



Mean rejection p-value: 0.00568, ~ 2.76 sigma

ICRC Systematics tables

Parameter	Treatment Free/Fixed/Prior	Fit value	Treatment	Fit value
Δm_{31}^2 [10^{-3} GeV 2]	Free	$2.56^{+0.668}_{-0.847}$	Free	$2.56^{+0.7}_{-1.08}$
θ_{23} [deg]	Free	$40.7^{+24.5}_{-14.2}$	Free	$40.7^{+23}_{-28.2}$
Norm ORCA4	Fixed	1	$\mathcal{N}(1, 0.15)$	$1^{+0.126}_{-0.127}$
Norm ORCA6	Fixed	1	$\mathcal{N}(1, 0.15)$	$1^{+0.15}_{-0.15}$
Flux: spectral index	Fixed	0	$\mathcal{N}(0, 0.3)$	$0^{+0.0608}_{-0.0513}$
Flux: zenith angle bias	Fixed	0	$\mathcal{N}(0, 0.07)$	$0^{+0.0689}_{-0.0681}$
Skew $\mu\bar{\mu}$	Fixed	0	$\mathcal{N}(0, 0.1)$	$0^{+0.0999}_{-0.0998}$
Skew e/\bar{e}	Fixed	0	$\mathcal{N}(0, 0.1)$	$0^{+0.1}_{-0.1}$
Skew μe	Fixed	0	$\mathcal{N}(0, 0.05)$	$0^{+0.03}_{-0.03}$
NC normalization	Fixed	1	$\mathcal{N}(1, 0.1)$	$1^{+0.0997}_{-0.0998}$
τ normalization	Fixed	1	$\mathcal{N}(1, 0.2)$	$1^{+0.199}_{-0.197}$
Energy scale	Fixed	0	$\mathcal{N}(0, 0.1)$	$0^{+0.00511}_{-0.00529}$

Systematic uncertainty				
Parameter	Δm_{31}^2 difference		θ_{23} difference	
Variation in nuisance parameter	+1 σ	-1 σ	+1 σ	-1 σ
Normalisation ORCA4	-0.355	-0.0577	-4.08	5.07
Normalisation ORCA6	1.88e-08	0	-2.02e-06	0
Flux: spectral index uncertainty	-1.48	0.122	-5.35	6.54
Flux: angle distribution bias	-0.0239	0.0289	4.9	-4.51
Skew $\mu\bar{\mu}$	0.0111	-0.0127	-0.689	1.01
Skew e/\bar{e}	0.00295	-0.00364	-0.0863	0.0841
Skew μe	-0.00212	0.00172	0.185	-0.263
NC normalization	0.011	-0.0106	-0.466	0.563
τ normalization	0.0171	-0.0125	-2.76	1.96
Energy scale	0.00958	-0.0296	-0.215	1.82
Total uncertainty	1.52	0.143	8.82	9.87

$$\theta_{23} = 40.7^{+24.5}_{-14.2} \text{ (stat.)} \pm 9.87 \text{ (syst.) [deg]}$$

$$\Delta m_{31}^2 = 2.56^{+0.668}_{-0.847} \text{ (stat.)} \pm 1.52 \text{ (syst.) [10}^{-3}\text{eV}^2\text{]}$$