

Systematics

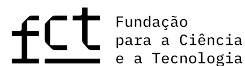
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Scattering and Neutrino Detector
at the LHC



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1 ν_μ Error Estimation

Estimating Systematic ν_μ Errors

ν_μ event selection goes through the following cuts :

- **Fiducial Volume**

- SciFi : Vertical [+200;-336] ; Horizontal [+300;-200]
- DS : Horizontal Bars 70-105 and Vertical 10-50

- Track required intercepting the first Scifi plane
- Sum of DOCA between track and hits < 3 cm
- > 35 Scifi Hits
- QDC for Upstream Muon System > 600
- Maximum of 10 hits in the Downstream Muon System

Used partition 0 through 50 from

`/eos/experiment/sndlhc/MonteCarlo/Neutrinos/Genie/sndlhc_13TeV_down_volMuFilter_20fb-1_SNDG18_02a_01_000/`, with a total of 40272 ν events

Fiducial Volume Systematic Errors

Fiducial Volume Cut Set			Surviving Events	Selection Efficiency (%)	Deviation from Baseline
	Vertical	Horizontal			
Baseline	[200,-336]	[300,-200]	1367	3.39	-
SciFi	[220,-366]	[330,-220]	1260	3.13	-0.26
	[180,-306]	[270,-180]	1458	3.62	+0.23
	[300,-436]	[400,-300]	966	2.40	-0.99
	[100,-236]	[200,-100]	1626	4.04	+0.65
Baseline	[70,105]	[10,50]	1367	3.39	-
DS	[74,101]	[14,46]	1158	2.88	-0.51
	[66,109]	[6,54]	1476	3.67	+0.28