ν

ARCA115. TELESCOPIOS DE NEUTRI

INDEX

1. IN WHAT GROUP HAVE WE BEEN ON?
2. WHAT IS A NEUTRINO TELESCOPE?
3. THE IMPORTANCE OF NEUTRINO TELESCOPE
4. THE PROGRAM BASIS
5. OUR PROJECT
    a. FIRST PLOTS
    b. CUTS
    c. FINAL PLOTS

1

IN WHAT GROUP HAVE WE BEEN ON?

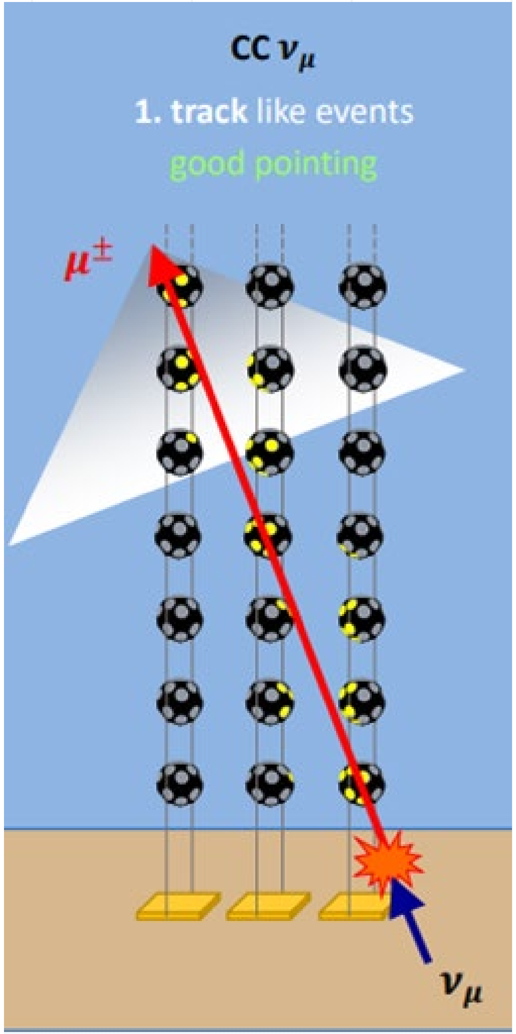
KM3NeT

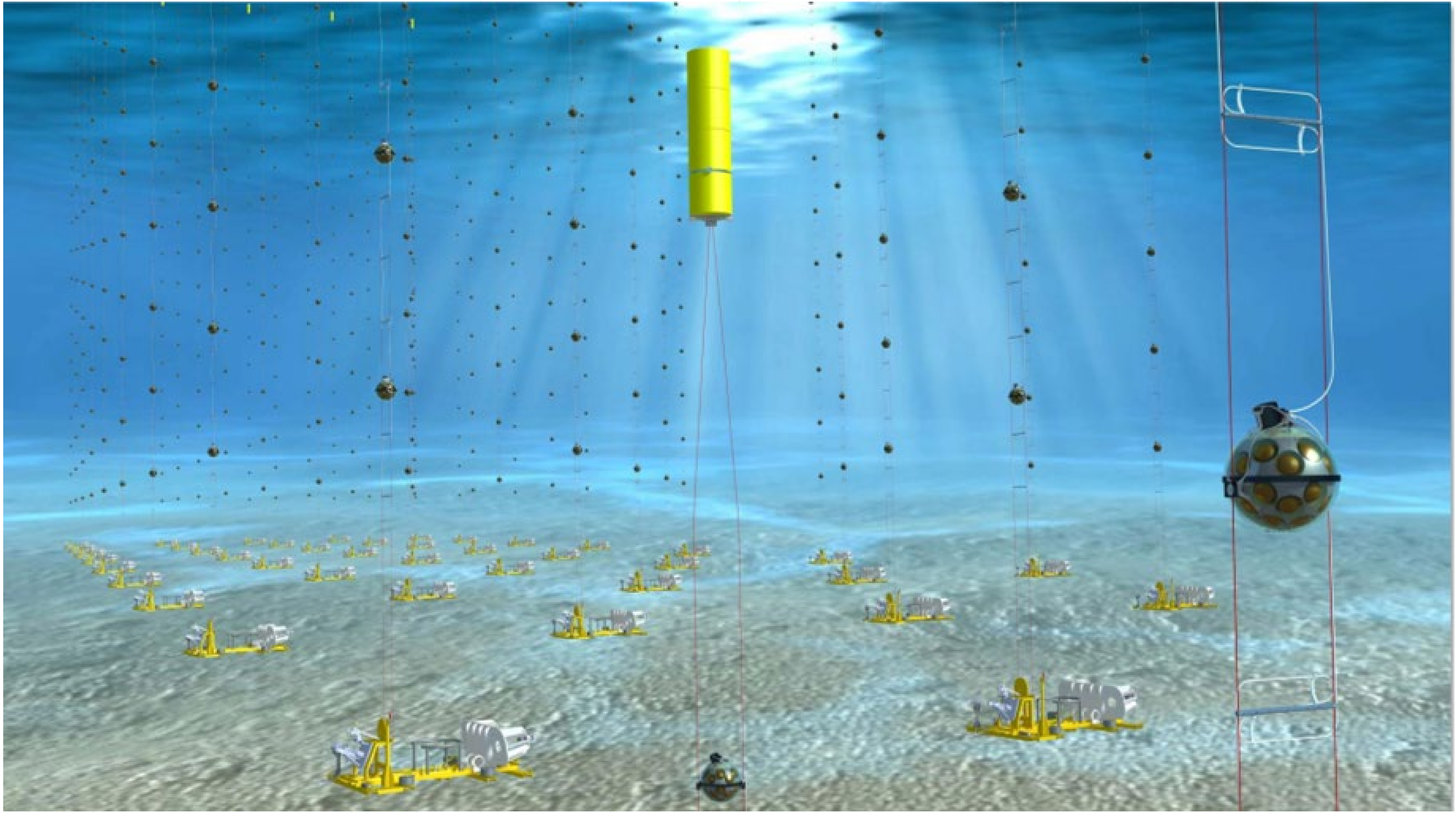
ARCA

ORCA

2

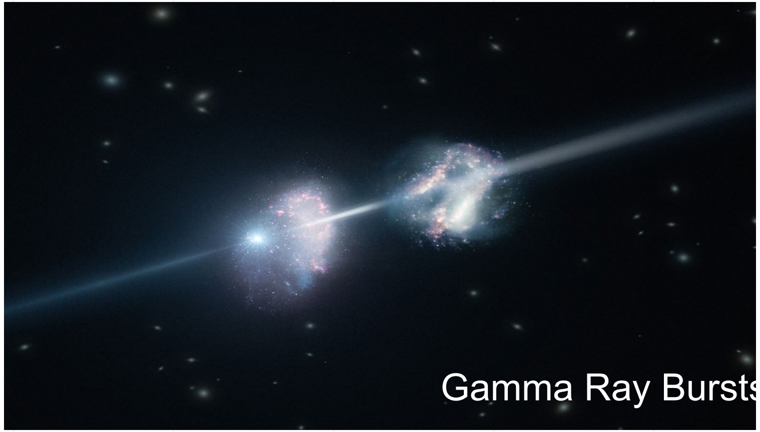
WHAT IS A NEUTRINO TELESCOPE?


CC ν_μ
1. track like events
good pointing
$\mu^\pm$
ν_μ



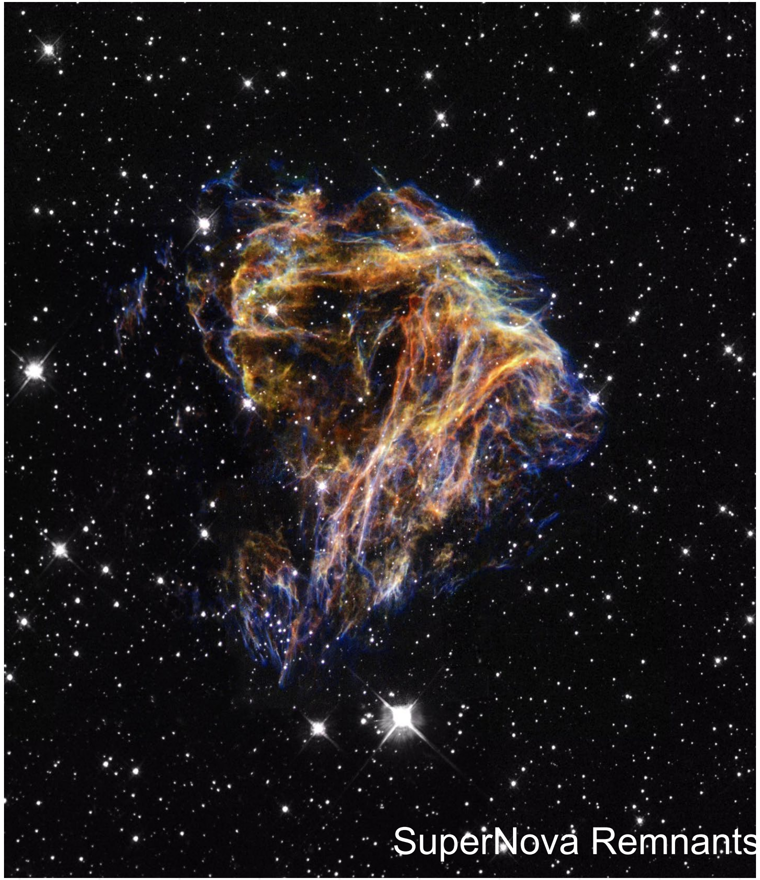
3 THE IMPORTANCE OF A NEUTRINO TELESCOPE

WHAT IS OUTSIDE? HOW DOES IT WORK?

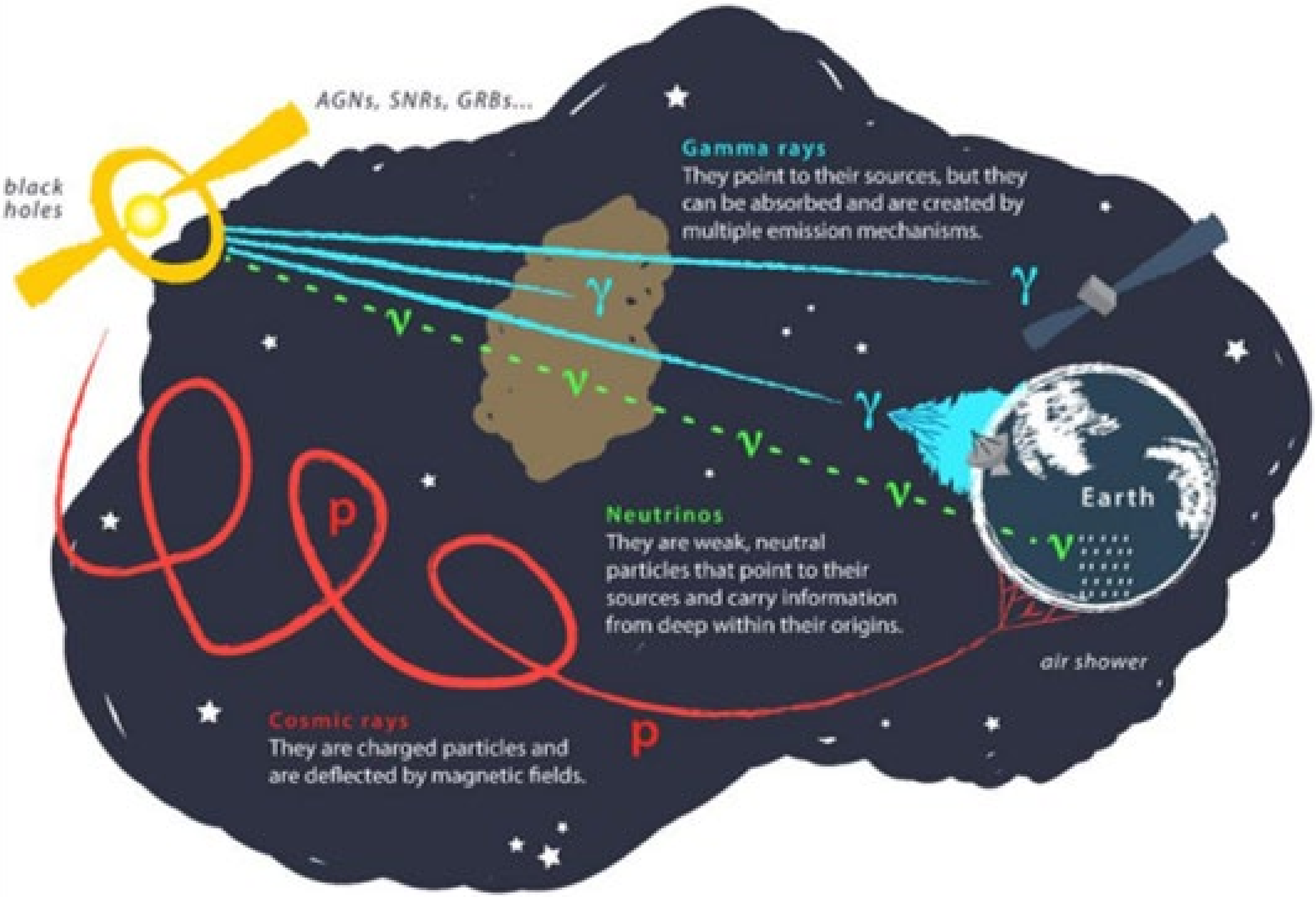


Gamma Ray Bursts

Active Galactic Nucleus



SuperNova Remnants



AGNs, SNRs, GRBs...
black holes
Gamma rays
They point to their sources, but they can be absorbed and are created by multiple emission mechanisms.
γ
ν
Neutrinos
They are weak, neutral particles that point to their sources and carry information from deep within their origins.
Earth
air shower
p
Cosmic rays
They are charged particles and are deflected by magnetic fields.

4 THE PROGRAM BASIS

THE PROGRAM WE HAVE BEING USING

ARCA is under construction but we have been using a simulation of ARCA115

- **MONTE CARLO SIMULATION**

True Energy

True Direction (Zenith)

- **RECONSTRUCTION ALGORITHM**

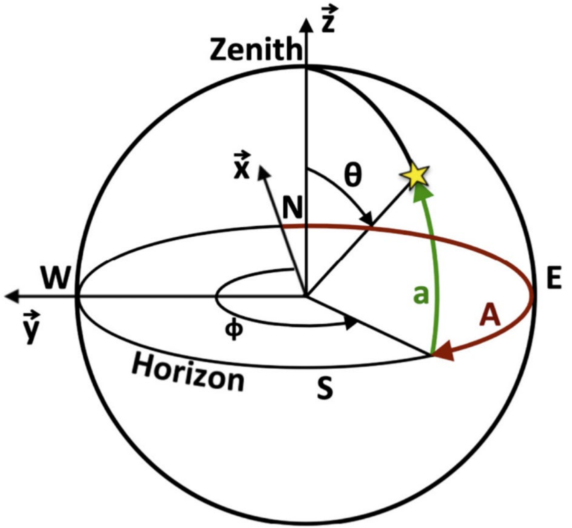
Reco Energy

Reco Direction (Zenith)

Reco Variables (Track Length, Angular Error (Beta0)…)

And for the data analisis:

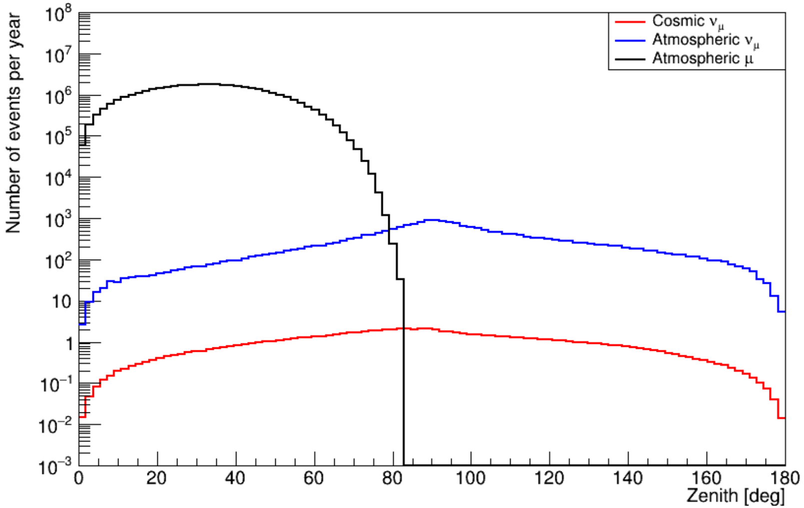
- **ROOT**



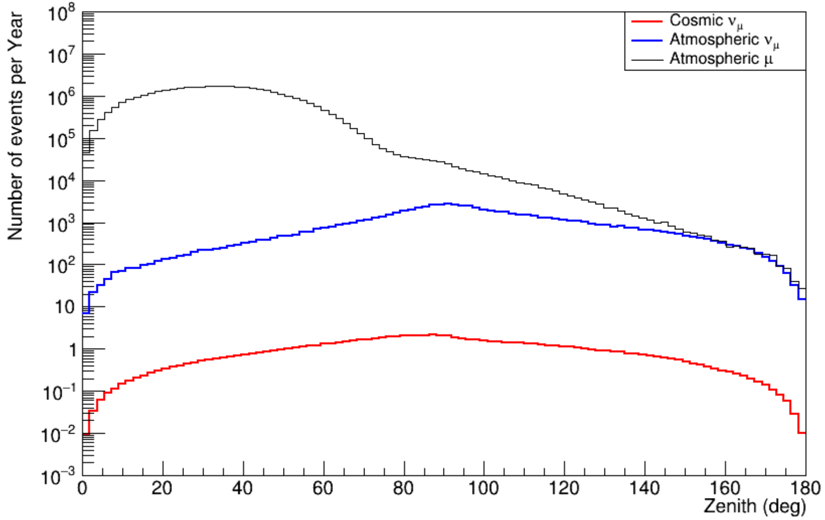
OUR PROJECT 5

FIRST PLOTS

True Zenith Distribution (MC)



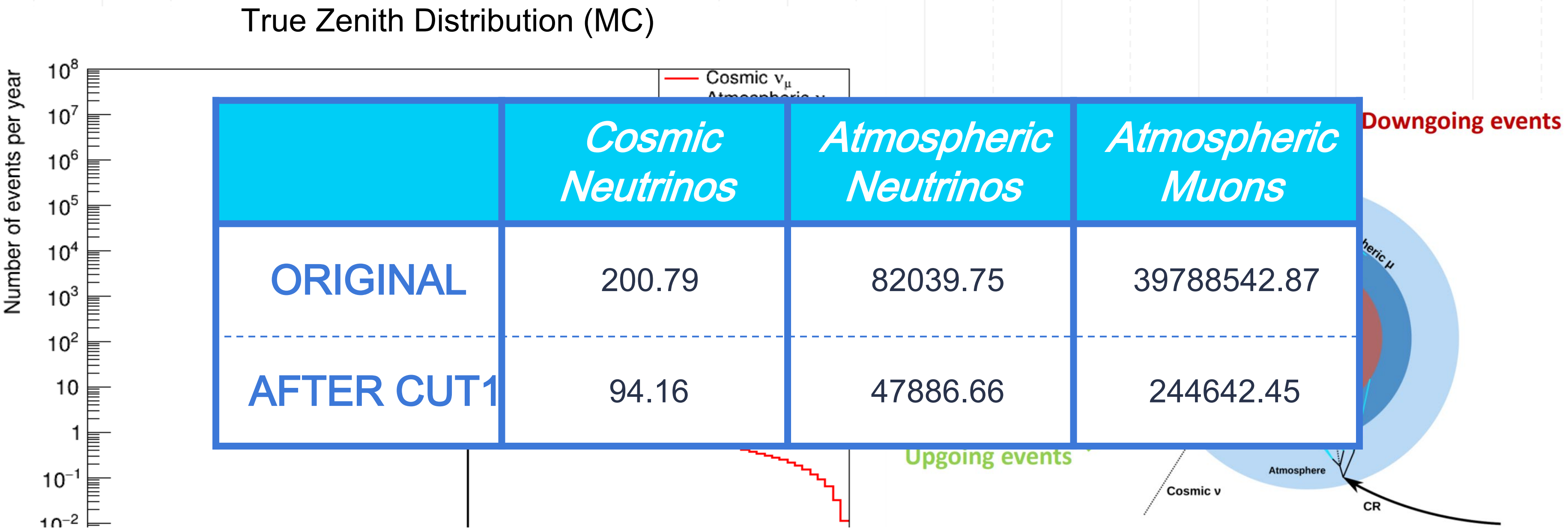
Reconstructed Zenith Distribution



ASSUMED COSMIC NEUTRINO FLUX: $\phi=\phi_0 \cdot E^{-2}$

$\phi_0=1.2\cdot 10^{-8}\ \mathrm{GeV^{-1}cm^{-2}s^{-2}sr^{-1}}$

CUTS

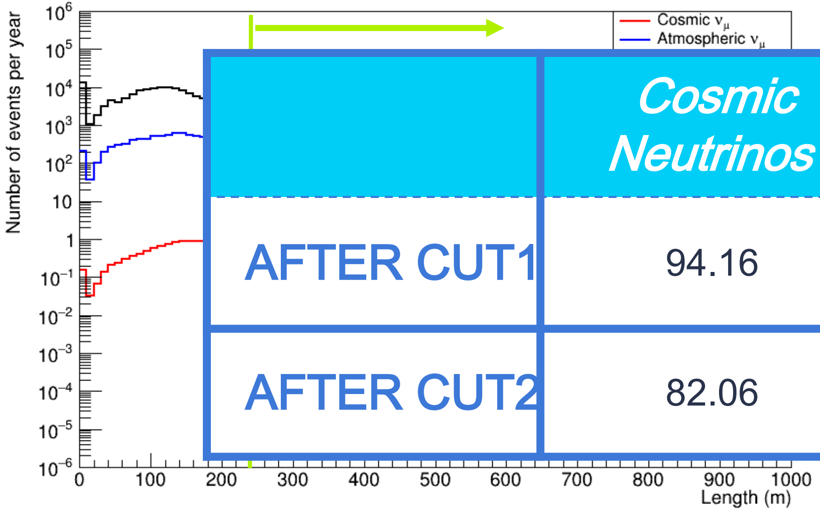


	Cosmic Neutrinos	*Atmospheric Neutrinos*	*Atmospheric Muons*
ORIGINAL	200.79	82039.75	39788542.87
AFTER CUT1	94.16	47886.66	244642.45

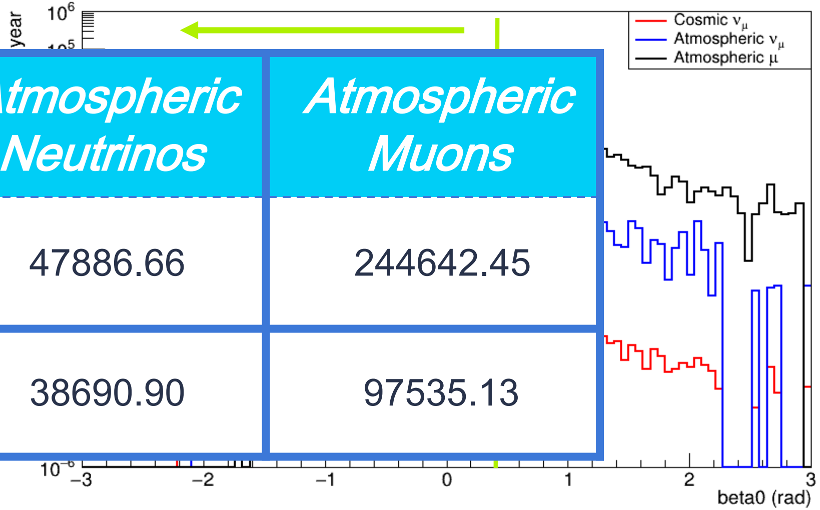
WE REJECT 99.38% OF THE ATMOSPHERIC MUO

CUTS

Track Length



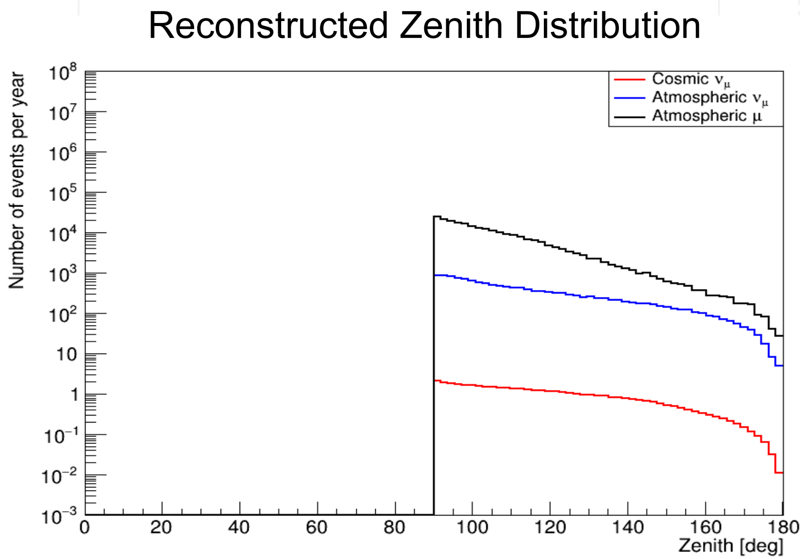
Angular Error

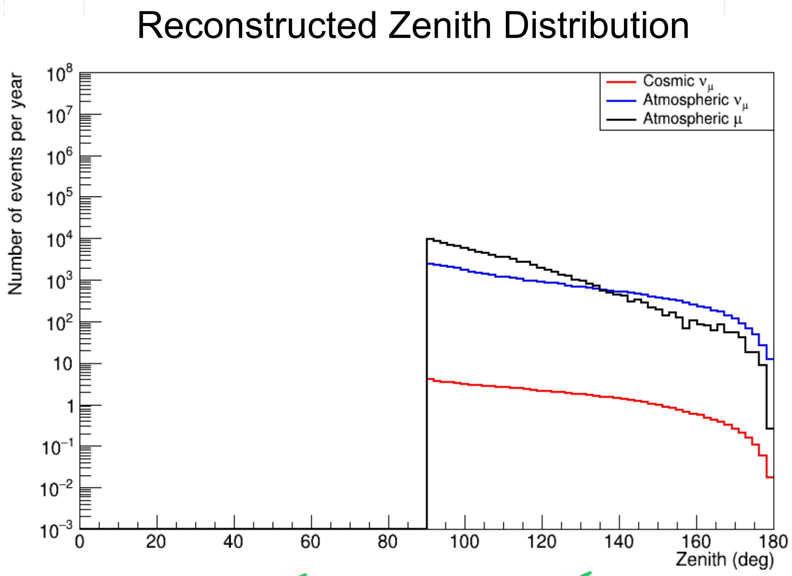


	Cosmic Neutrinos	*Atmospheric Neutrinos*	*Atmospheric Muons*
AFTER CUT1	94.16	47886.66	244642.45
AFTER CUT2	82.06	38690.90	97535.13

WE REJECT 60.13% OF THE ATMOSPHERIC MUO

FINAL PLOTS



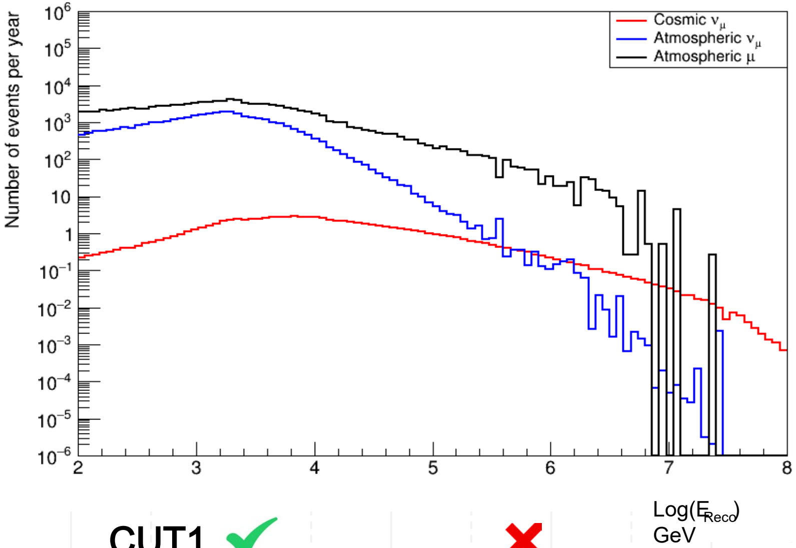


CUT1 ✔ CUT2 ✘

CUT1 ✔ CUT2 ✔

FINAL PLOTS

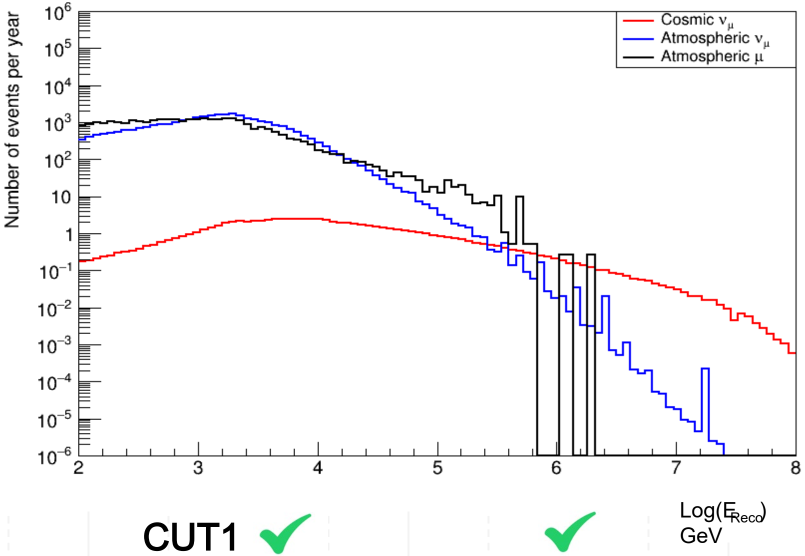
Energetic Estimator



CUT1 ✔

CUT2 ✘

Energetic Estimator



CUT1 ✔

CUT2 ✔

THANKS!


YOU GET A NEUTRINO
AND YOU GET A NEUTRINO,
NEUTRINOS FOR EVERYBODY!!!!