Mohamed I University
Faculty of Science
Oujda

Monopoles analysis

Imad El Bojaddaini

Physics of Matter and Radiation Laboratory

06/01/2016

ANTARES sensitivity

(some remarks)

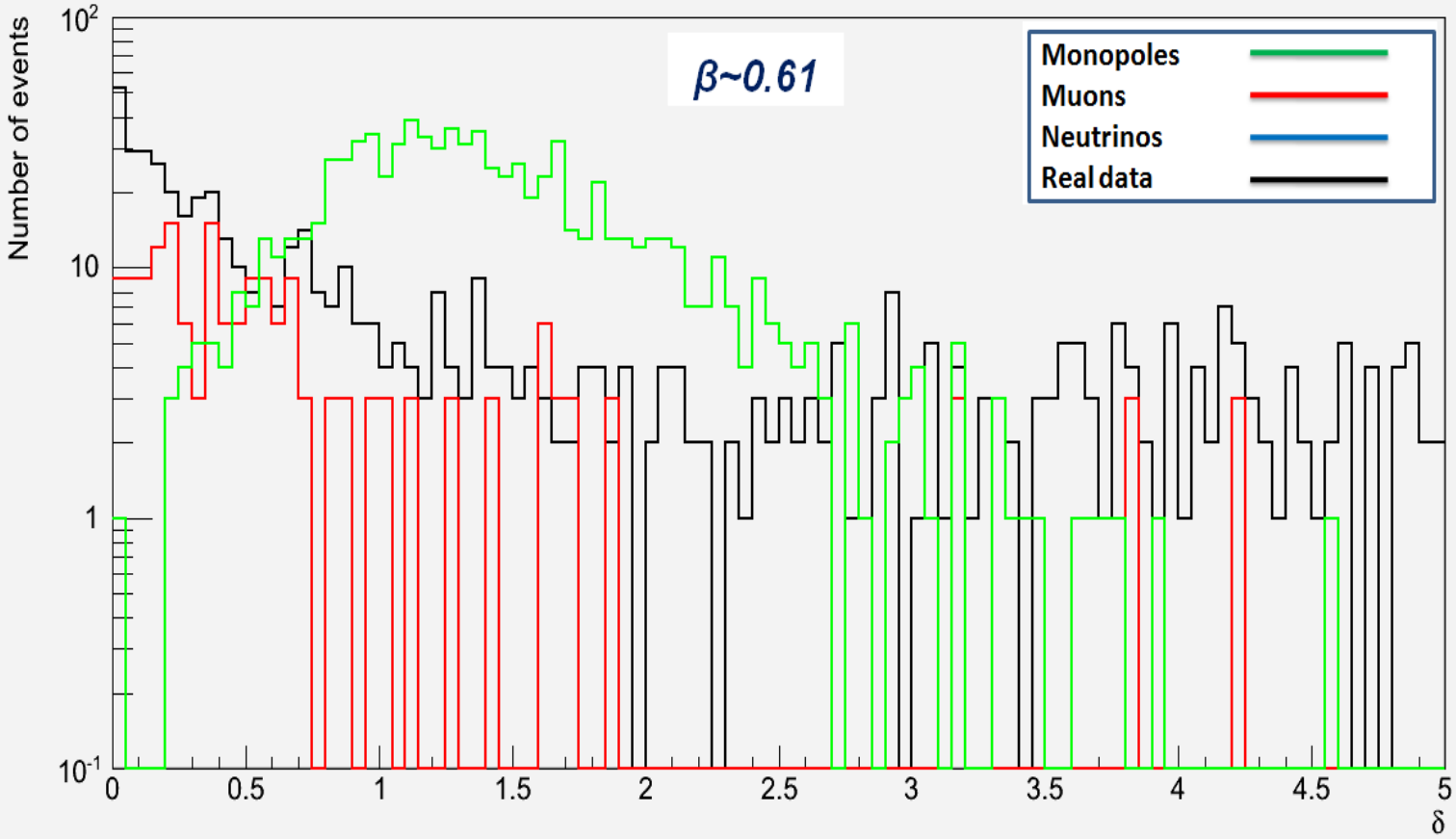
Feldman-Cousins approach

The 90% C.L sensitivity :

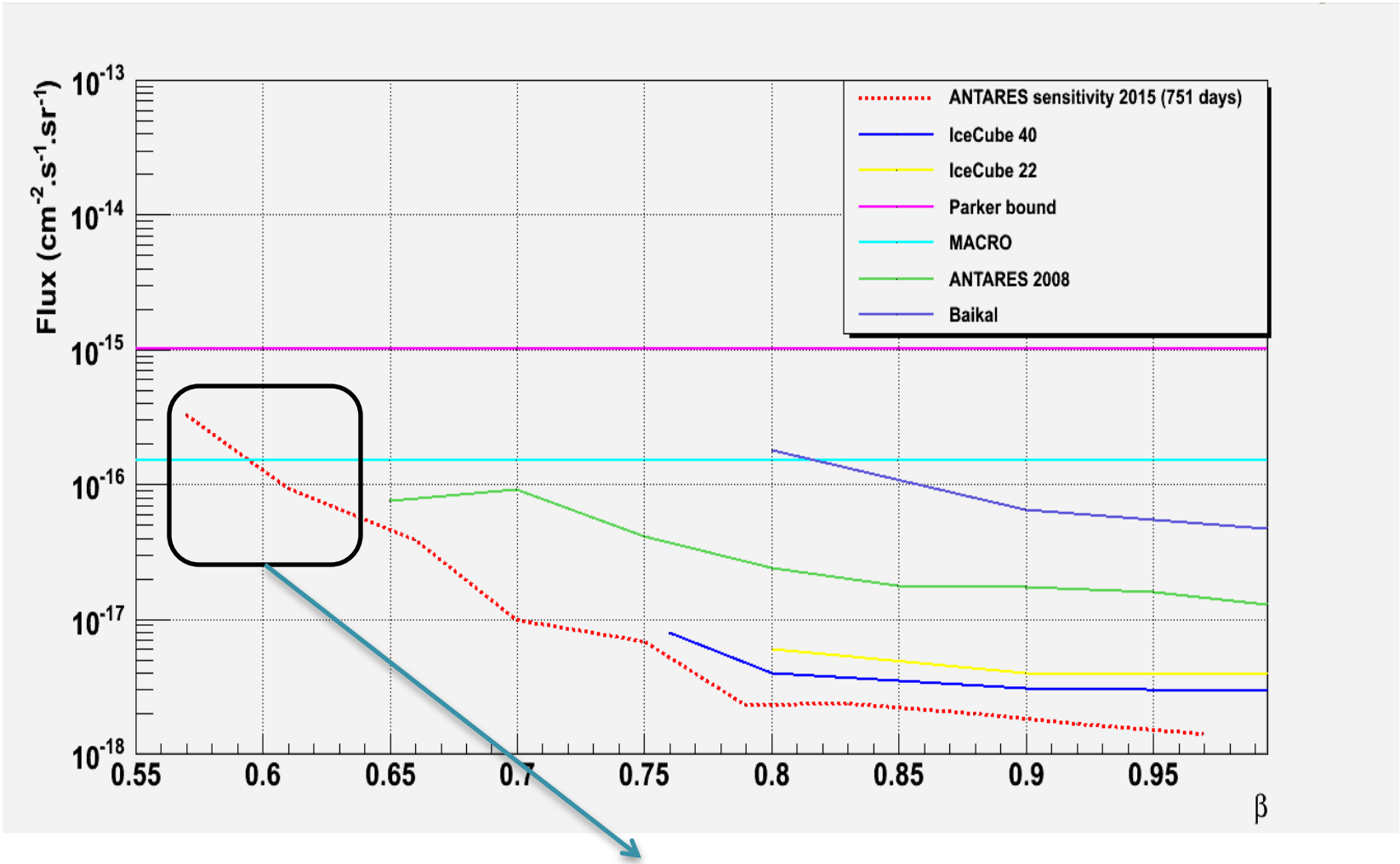
$$\overline{\mu}_{90}(n_b) = \sum_{n_{obs}=1}^{\infty} \mu_{90}(n_{obs}, n_b) \frac{n_b^{n_{obs}}}{n_{obs}!} e^{-n_b}.$$

The 90% C.L limit

Bad behavior of the reconstructed events



Sensitivity

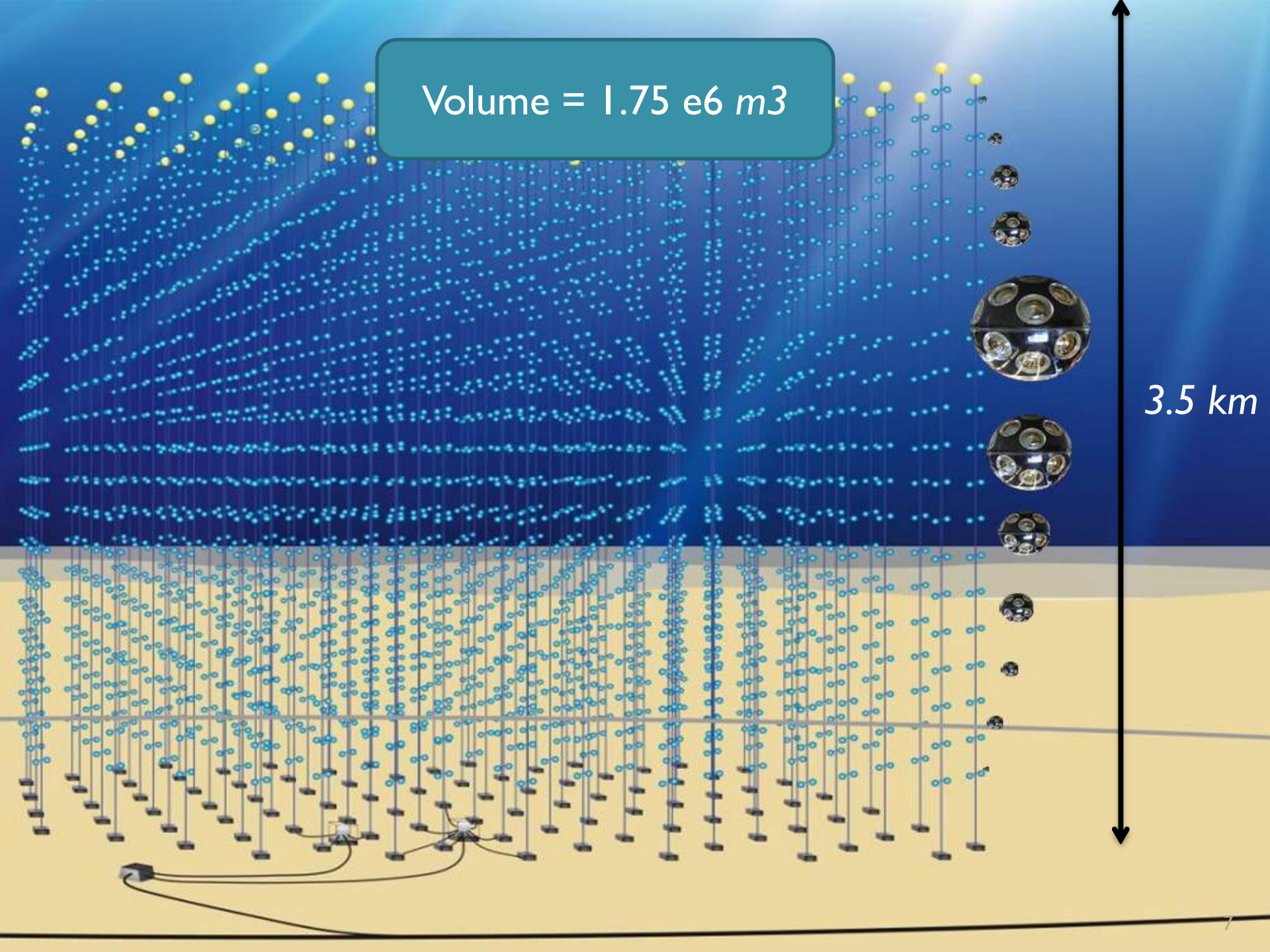


In the first two ranges of beta**, the number of real events remaining after cuts is high **although all the background has been eliminated

➔ ***the limit on flux can not be set in this region***

KM3NeT

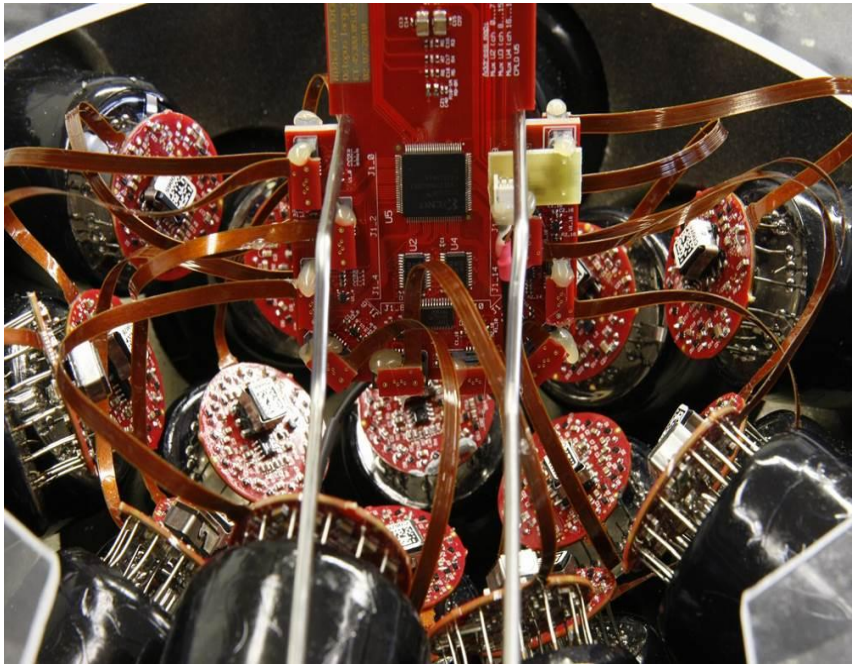
(Multi cubic kilometer Neutrino Telescope)


Volume = 1.75 e6 *m3*
3.5 km

- *154 strings*
- *20 DOM/string*
- *31 PMs/DOM (3-inch)*
- *The distance between neighboring strings is 95m*
- *The vertical distance between adjacent DOMs is 6m*

Digital Optical Module DOM

KM3NeT Digital Optical Module (DOM) in the laboratory



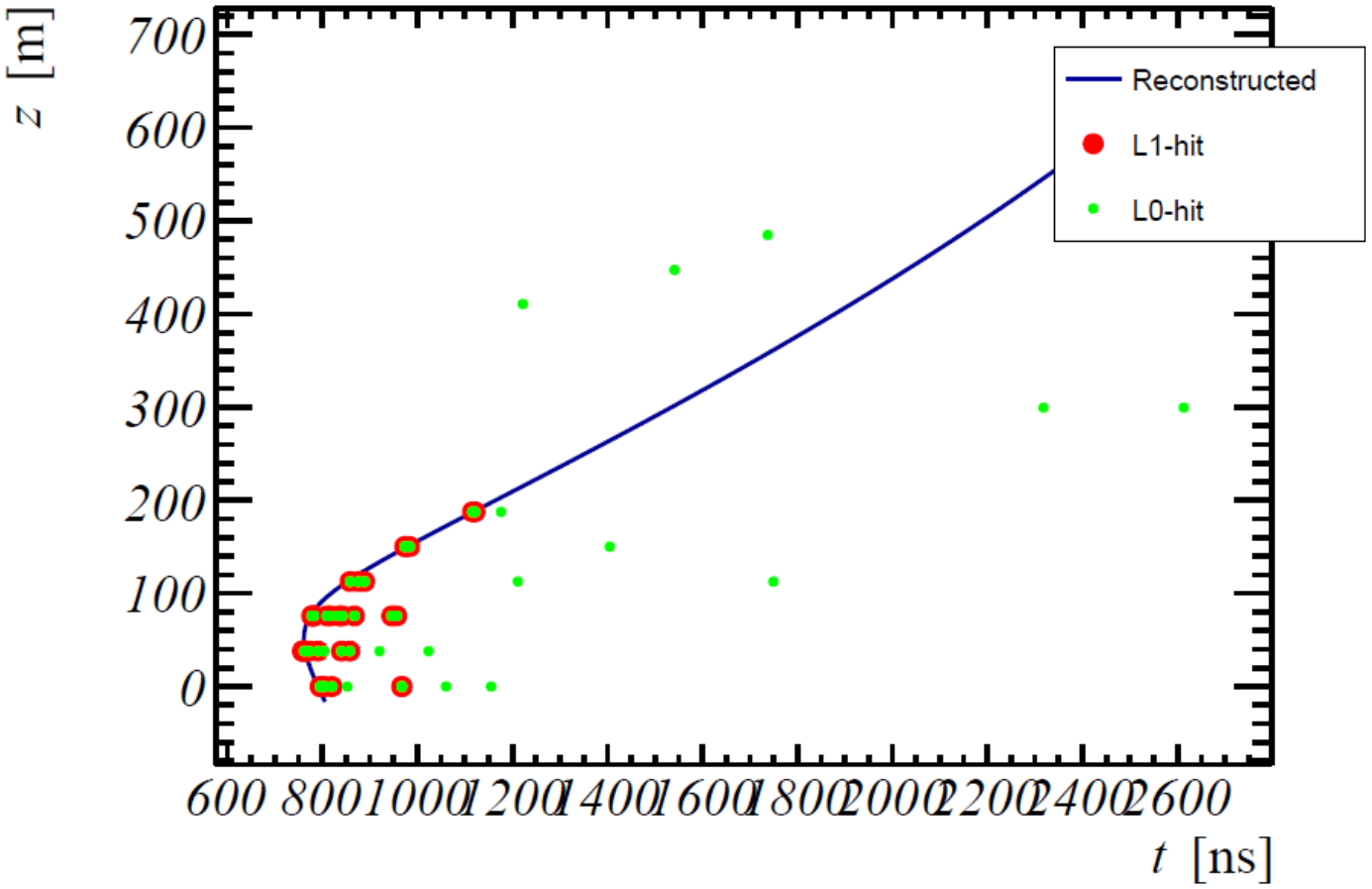
Electronics to read out the photomultiplier tubes and calibration instrumentation inside the KM3NeT DOM

Important terms used in the analysis

- ***Events :*** ***cosmic and atmospheric neutrinos, atmospheric muons***
- ***Reconstruction***
- ***Effective area***
- ***Sensitivity***

First string : a possible observation of the first neutrino in KM3NeT

Needs to be confirmed !



L0 : Amplitude > 0.3 pe
L1 : L0 coincidence in 2 adj. PMTs in same OM within 20 ns

Thanks for your attention !