Mechanical Supports for the Pierre Auger Upgrade Program

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The Pierre Auger Observatory is a hybrid detector designed to study ultra-high energy cosmic rays[1] and it has been taking data from 2005. An upgrade program has been finalized and provides the use of an additional scintillator detector to the surface Cherenkov detectors [2]. The idea is to get the muons from the comparison with the tanks signal or to use a global fit based on the universality.
The detector proposed is a 2 m^2 scintillator made by twenty-seven 1.8 m scintillator bars with green wavelength shifting optic fiber, as the one used for AMIGA [3]. The fibers are put together and read by a single PMT (similar to small PMT like in [4]). The detector enclosure is made from foam PVC of 5 mm of thickness, to limit the total weight and ease its manipulation. The detector, the PMT and the electronics, need to be host in a mobile structure on top of the SD roof. The structure must stand very high wind storm (up to 140 km/h) and preserve the load from the winter snow.
In order to design this structure several studies have been carried out by different groups. In Lecce we have proposed aluminum mechanical structures with anchor points in the field surrounding the SD tank. In the figures we show two different proposals for the detector scintillator supports.

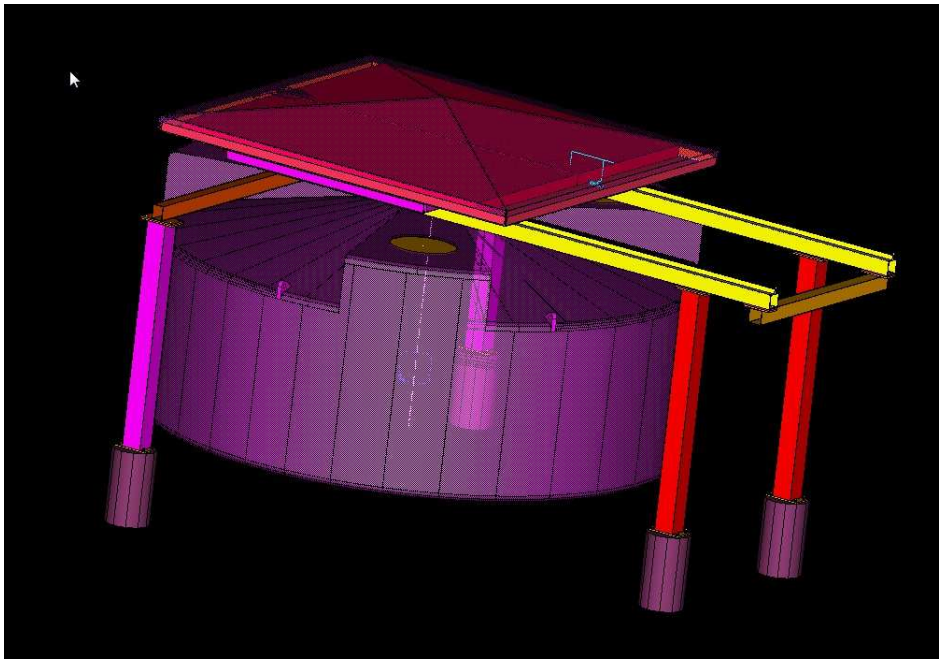

Figure 1. First proposal for mechanical structure.

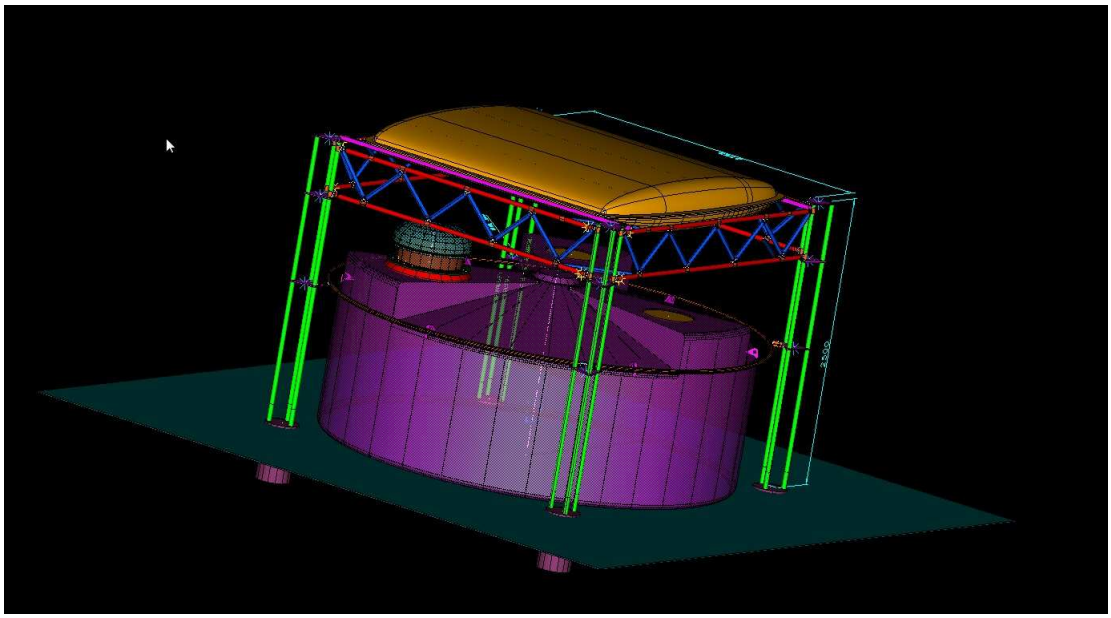

Figure 2. Second proposal for mechanical structure.

REFERENCES

1. Abraham J *et al Nucl. Instrum. Meth.* **A523**, 50.
2. *Proposal for Auger Beyond 2015: ASC-II: Auger Scintillators for Composition II.* 2040-2013-05-ascii-proposal.
3. A. Etchegoyen et al., AMIGA Design Repost (2006).
4. R.Assiro et al., "Small PMT Test Measurements", this year annual report.