

## **Annex #3. Sharing of data to allow study of station-to-station comparisons between the TA scintillator SD and Auger water Cherenkov SD stations – Auger@TA setup in Delta, UT**

---

*February 22, 2017 – Draft to CB*

The scope of this annex is to identify the data to be shared between the Auger and TA collaborations as part of the Auger@TA project along the line of the umbrella MOU for data sharing already agreed upon by both collaborations.

### **1. The Auger@TA joint effort:**

The Auger@TA project currently comprises four dedicated SD stations, 2 TA stations and 2 Auger stations (one Auger station and one Auger North prototype station) installed near the TA CLF location. The first part of this project, for which data sharing is requested, aims at collecting coincidence signals between WCD and scintillator detectors at the station level and, with the help of simulations, understand the correlations between VEM-based and MIP-based signals.

### **2. Data samples:**

Data are collected using two separate triggers:

- Local trigger (under development): a local trigger formed by one “local” TA station and the two Auger stations allows for the collection of coincident events. Given the MIP and VEM calibrations of the TA and Auger stations respectively, one can make limited station level comparisons since no reconstruction is possible. All the data (waveforms and timing information) from those stations are to be shared. (\*)
- Global trigger (in operation): when a global TA trigger is formed, the data from the non-participating “global” TA station (DET2421) at the CLF is read out and a trigger is provided to the Auger stations, which can then be read out as well. For coincident events, the following data are to be shared:
  - Waveforms and timing information from the two Auger SD stations
  - Waveforms and timing information from the “global” TA station (DET2421)
  - Timing and integrated MIP signal from the four closest neighbors (DET1216, DET1217, DET1316, DET1317) and only the timing from all the other participating stations that are identified by TA to reconstruct a coarse shower geometry.
  - Later, and according to the TA reconstruction release schedule, the full reconstruction parameters including zenith angle, azimuth angle, core location and energy

If some associated events are found to be special by TA, the data sharing of those events can be postponed with notification.

(\*) As of today, the data taking of waveforms of the “local” TA station is not ready.