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The TRASGO Program. Current status and first results

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Research in cosmic rays is of interest for many fields of science: from Astrophysics and Solar Physics to the forecasting of magnetic storms or vulcanology. For such purposes many detectors using different techniques have been designed and are operative all around the world. A common feature of most of the neutron and muon monitors used at the Earth's surface for the regular survey of the cosmic ray background is that they are constrained to the measurement of single particles. As a consequence they only provide integral fluxes above a given energy threshold.

TRASGO is the acronym of “TRAck reconStructinG bOx” and the name corresponds to a project aiming the development of a set of high granularity tracking cosmic ray detectors sensitive to bundles of either muons or electrons and even of making a rough calorimetry of electrons. These features do allow a single ground based detector to measure cosmic ray background fluxes above different energy thresholds and, making use of the response function, to survey the primary cosmic ray flux in different energy ranges.

Actually, two Trasgo detectors are operative: TRAGALDABAS, located in Santiago de Compostela and TRISTAN, located in a Spanish Base in Antarctica. Two new detectors are being built as a part of the STRATOS project and will be installed at a distance of about 100 km far from TRAGALDABAS.

In this talk we will review the main features of the Trasgo detectors and some tools that are being developed within the framework of the program. We will also present some results related with the muon/electron separation capability of TRAGALDABAS and two cosmic ray surveys at different geomagnetic latitudes performed by the TRISTAN detector between Vigo (Spain) and Punta Arenas (Chile) in 2018 and 2019.

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