Overview of Argentinean Activities regarding Space Weather Studies in Antarctica

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The Latin American Giant Observatory (LAGO) will be installing its first node, during this summer campaign (January-February 2019) in the Antarctic Peninsula, a dedicated site to Space Weather studies in Argentinean Marambio Station.

LAGO is a network of Water Cherenkov detectors, with nodes in Argentina, Bolivia, Colombia, Chile, Ecuador, Guatemala, Mexico, Peru, Venezuela, and Brazil. Spain participates in the network with computational facilities. Among the Scientific objectives, there are studies of the energy spectrum of the secondary particles generated by the primaries in the atmosphere, and the analysis of the integrated flux. The Space Weather conditions can be monitored through the flux modulation in a particularly favorable geomagnetic location due to its rigidity cut off, allowing the studies of energetic particles originated at the Sun, GLEs (Ground Level Enhancements), and Forbush decreases.

The atmosphere at the site location was studied to asses seasonality of the atmospheric, temperature and pressure with height (density was computed from the later variables). There are also ongoing studies aimed to provide insight of the temperature and ozone variability during periods of geomagnetic storms and the eventual effects on the tropopause and middle and low stratosphere if any.

The results of these studies will help to understand the possible impact of Space Weather events on the Antarctic Atmosphere and to perform the corrections in order to improve the numerical simulations of the extended secondary showers of particles. In this way will be able to compute the corrected flux at ground level and compare them with the observed one at the Antarctic location.

In this work will also be mentioned the firsts activities taken by Argentina towards operative Space Weather describing the activities developed since 2016 in that regard, carried out by four institutions: Departamento de Ciencias de la Atmósfera y los Océanos at Universidad de Buenos Aires (DCAO-UBA), Servicio Meteorológico Nacional (SMN), Instituto de Astronomía y Física del Espacio (IAFE) and Instituto Antártico Argentino (IAA).