



Atmospheric Electric Field measurements at Eastern North Atlantic ARM Climate Research Facility: Global Electric Circuit Evolution

Francisco Lopes (1), Hugo Silva (1,2), Kim Nitschke (3), and Eduardo Azevedo (4)

(1) Laboratory of Atmospheric Electricity, Institute of Earth Sciences, University of Évora, Portugal, (2) Renewable Energies Chair, University of Évora, Portugal., (3) Field Instruments Deployment and Operations, Los Alamos National Laboratory, Los Alamos, U.S., (4) Research Centre of Climate, Meteorology and Global Change of the University of the Azores, Portugal

The Eastern North Atlantic (ENA) facility of the ARM programme (established and supported by the U.S. Department of Energy with the collaboration of the local government and University of the Azores), is located at Graciosa Island of the Azores Archipelago (39° N; 28° W). It constitutes a strategic observatory for Atmospheric Electricity since it is located in the Atlantic Ocean basin exposed to clean marine aerosol conditions which reduces the well known spectral signature of atmospheric pollution and enables the study of the so called Global Electrical Circuit (GEC). First evidences of the existence of a GEC affecting the Earth's Electric Environment has retrieved by the Carnegie cruise expedition, in what became known as the Carnegie Curve. Those measurements were made in the Ocean in several campaigns and the present studies aims at reconsidering measurements in similar conditions but in a long-term basis, at least 5 years. This will contribute to the understanding of the long-term evolution of the Ionospheric Potential (IP). In literature there is theoretical evidence that it is decreasing IP in strength, but that conjecture is still lacking valid experimental evidence. Moreover, to clearly identify the GEC signal two effects must be taken into account: the effect of surface radon gas variation, because the Azores Archipelago is a seismic active region the possible influence of Earthquakes cannot be discarded easily; the effect of short-term solar activity on the Atmospheric Electricity modulation, solar flares emitting solar particles (e.g., solar energetic protons) need to be considered in this study.