

Quiet day curve for riometer: Analysis and comparison of methods

Ricardo Ezequiel Garcia^{1,2}, Guillermo Daniel Rodriguez^{1,2}, Leonardo Navarria^{1,2}

¹ Facultad de Ciencias Astronómicas y Geofísicas - Universidad Nacional de La Plata.

² Facultad de Ingeniería - Universidad Nacional de La Plata

Abstract:

The RIOMETER is a passive instrument that measures the intensity of the cosmic signal that reaches the Earth's surface. With the adequate analysis of this signal, it is possible to determine the attenuation suffered by them, when traveling through the ionosphere, particularly at the altitudes of the D region.

Both in the most basic zenithal beam instruments and in the more sophisticated multi-beam (or image RIOMETER), multifrequency, or mesospheric radar instruments, it is extremely important to obtain a correct reference curve corresponding to a calm day (Quiet Day Curve - QDC) in order to carry out this analysis. That "Quiet Day" is, in its most basic form, the attenuation suffered by the signal on those days when the ionosphere is undisturbed.

Since the beginning of the use of this technique, various methods have been developed and proposed to obtain this QDC, with varying degrees of implementation complexity and advantages. In general, the selection of one of these methods is based on the type of analysis we are interested in performing with the RIOMETER data, levels and nature of the interference at the site, noise, etc.

In this work, we analyze and apply several methods to take the QDC, according to Tanaka-Moro, of Percentile, of the point of inflection and based on Fourier Analysis, with data from RIOMETERs based on the Trelew Geophysical Observatory (National University of La Plata), Chubut, Argentina, and discuss the results to compare the methods.

Scientific Session: Ionosphere and Upper Atmosphere

Presenting author: Guillermo D. Rodriguez