

Abstract

The main goal of this paper is to demonstrate the multifractal behavior of the ionospheric plasma signals recorded by the ISL instrument installed onboard of the DEMETER satellite before the L'Aquila earthquake of 2009. Multifractal analysis is performed using the so-called the wavelet transform modulus maxima lines (WTMM) method. Signals to be analyzed are: density of electrons and ions, temperature of electrons, and the potential of the plasma. WTMM analysis of the data recorded during April 4, 2009 which recognizes many ionospheric disturbances before the L'Aquila earthquake clearly shows the multifractal behavior of the ionosphere plasma physical response. WTMM analysis of data recorded by the DEMETER satellite two months after the L'Aquila earthquake main shock shows the monofractal behavior of the plasma response.