

## Analysis mhd solar activity using robust methods

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### Abstract

© 2018, International Multidisciplinary Scientific Geoconference. All rights reserved. The aim of this paper is to analyze magnetohydrodynamic (MHD) solar activity on the basis of modeling and predicting the Wolf number dynamics. This study is based on the use of adaptive regression modeling approach implemented in the software package ARDM (adaptive regression dynamic modeling). The preliminary data was investigated for the presence of trend stability with fractal analysis. Currently, not only the experts in the field of solar physics, climatologists, and researchers in many fields related to the issue, but most of the world's population is conscious of the solar activity influence on many processes occurring in the world and directly defining the conditions of life and health. Most of the phenomena taking place on the Earth are indeed related to the solar activity either directly or indirectly. The solar activity is characterized by the number of spots produced on the sun surface. Their number is determined by a formula proposed by Rudolf Wolf. Variations of the solar activity are cyclic, with their minimum and maximum. Correspondingly, the effects of its influence are different. Thus, the ARDM software package is modified and the analysis, modeling and forecasting of the solar activity are carried out. The initial data includes two time series: the Wolf number over the period between 2000 and 2011 averaged monthly (124 cases) and the Wolf number over the same period averaged weekly (484 cases).

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### Keywords

Fractal geometry, MHD solar activity, Regression analysis, Wolf number

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