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Computational topology of global solar magnetic field

L. Karimova (1), N. Makarenko (2), M. Novak (3)

Institute of Mathematics, Kazakhstan (chaos@math.kz), (2) Pulkovo Astronomical Observatory of RAS (ng-makar@mail.ru), (3) School of Mathematics, Kingston University, England (novak@kingston.ac.uk)

The paper focuses on analysis of global reversions of large scale solar magnetic field by means of computational topology methods. A reversion means changing a sign of field dipole component on the solar poles. There was used time sequence of 10 synoptic charts representing the distribution of a sign of background magnetic field averaged over one 27-days-long Carrington rotation in a form of cylindrical projection. The rate of the change of a number of ε disconnectedness components on the charts, formed by unipolar magnetic structures, versus resolution is characterized by disconnectedness index. For simplest self-similarity fractals the value of the index can coincide with box dimension. It has been revealed a difference of ε disconnected components behavior for magnetic structures without reversions compare to ones containing its. Reversions are characterized by disappearance of distinguish scales of magnetic structures (fractality), and as a result, by larger linear interval for estimation of disconnectedness index. Revealed effect may be explained as demonstration of self-organizing criticality in large scale magnetic field dynamics.