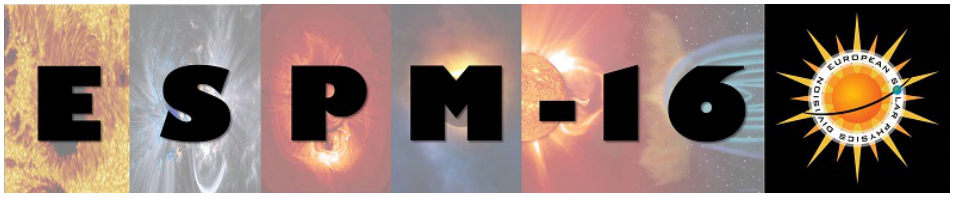


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# Analysis of Pseudo-Lyapunov Exponents of Solar Convection Using State-of-the-Art Observations

*Tuesday, 7 September 2021 09:26 (13 minutes)*

The solar photosphere and the outer layer of the Sun's interior are characterized by convective motions, which display a chaotic and turbulent character. In order to further investigate those motions, we estimated the pseudo-Lyapunov exponents of the overshooting convection described by current state-of-the-art observations of the Sun's surface. In particular, we applied a method employed in the literature to estimate the pseudo-Lyapunov exponents, as well as another technique deduced from their definition, to the spectro-polarimetric data acquired with the ground-based Interferometric Bidimensional Spectrometer (IBIS) and Crisp Imaging SpectroPolarimeter (CRISP) instruments, and the space-borne Helioseismic and Magnetic Imager (HMI). Following previous studies in the literature, we computed maps of four quantities which were representative of the physical properties of solar plasma in each observation, and estimated the pseudo-Lyapunov exponents from the residuals between the values of the quantities computed at any point in the map and the mean of values over the whole map. We found that all the computed exponents hold negative values, which are typical of a dissipative regime, in contrast to previous results reported in the literature. We also found that the values of the estimated exponents increase with the spatial resolution of the data and are almost unaffected by small concentrations of magnetic field.

## Student poster?

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