GRADIENT PATTERN ANALYSIS OF THE SOLAR ACTIVE REGION NOAA 11131

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Resumo. We present results from the application of the technique known as Gradient Pattern Analysis (GPA) to study the dynamics of an active region during a class X flare. Many spatial structures are formed during the extreme event, such as: filaments, spines, and light bridges. The formation of such structures is still an open question in solar physics. In this scenario, the symmetry fluctuation analysis, from the GPA, is an important clue to solar physics. The data consists of a 10 December 2010 SDO observation in 304A of the active region NOAA 11131, for a period of 6 hours. The results, based on the fluctuation of norms and phases of the gradient field, are able to detect extreme fluctuations in the space-time domain, which are compatible with the maximums measured in SFU. The variation of the spectral indices, via the Power Spectrum Density, indicates an underlying periodicity of ≈ 2.5 minutes, a result already evidenced in other works where the authors propose that these source dynamics are the result of wavefronts along the loops extending outwards from the magnetic bundles of the umbra.