Fractal properties of an active region and the flare

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This paper relies on observations of the activity complex NOAA 0039 and NOAA 0050 on 31 July 2002. Observations were carried out at ISTP SB RAS Baikal astrophysical observatory in the H-alpha line using a chromospheric telescope equipped with a Halle IPF with a 0.5Å pass band. Images of the same activity complex in a spectral band centered on the FeXI 171Å line obtained at the TRACE space observatory were processed using the same technique as was employed for the photos of the hydrogen chromosphere. The fractal and spectral methods were used to compute the time series for the activity complex fractal parameters. The following conclusions were made as the result: 1) the time variations of the fractal dimension of the activity complex show both the jump-like and quasi-periodic variations correlating with flares; 2) these variations were discovered both in the H-alpha line and in the FeXI 171Å line of the transition zone, based both on ground-based and onboard measurements - indicative of their solar origin.