

## **Variations in Gravitational Field, Tidal Force and Earthquakes (Sheki-Greater Caucasus, Azerbaijan)**

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Azerbaijan is caught in the active continent-continent collision of the Arabian plate with Eurasia. These regional tectonic processes give rise to earthquakes that have devastated the Caucasus throughout recorded history. Collision and seismic processes involve changes in the underground mass distribution with consequent modification of the gravity. Gravity measurements are able to detect such changes providing information suitable for understanding the physical sources of such phenomena. The time dynamics of the gravity signal measured and monitored in Sheki (Azerbaijan) (2011:11:28:08:48 - 2012:05:11:05:11:59), where mainly crust deformation processes are present, is investigated using the power spectrum method and multifractal detrended fluctuation analysis. Our findings indicate presence of two main periodicities (12 and 24 hours) in gravity signal embedded within an antipersistent structure at any timescale. The analysis of the second order fluctuation function reveals that the signal is antipersistent, with an excess (with respect to the simple linear behaviour) of fluctuation variation between about nine hours and two days. By using the detrended fluctuation analysis (DFA), fluctuation within the period of 38,34 hours (1 day 14 hours 34 seconds) was revealed. This fluctuation was assumed to be as a precedence of earthquakes which occurred in the adjacent Sheki region (western part of Azerbaijan). The nature of such excess of fluctuation at these timescales is still not very clear; maybe there is some correlation with the earth's gravity and the last stage of earthquake preparation that occurred in the region.