



Geophysical reconnaissance of an ancient slope failure in the Carpathian Mountains supported by UAV imagery

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The region of Vrancea-Buzau in the SE Carpathian Mountains in Romania is known as seismic region having endured at least four earthquakes of $MW > 7.4$ during the last two centuries (e.g. “the Great Quake” in 1802). Seismically induced ground failures are a common phenomena in the area, while especially deep-seated landslides and rock falls near the mountain ridges with pronounced scarps indicate triggering factors other than only of climatic nature.

The here presented site, called “Lacul Vulturilor” or “Eagles’ Lake”, is situated at a mountain ridge in the Carpathian Flysch. While previous research referred to it as possibly shaped by glacial activity, the here presented more recent hypothesis defines it as ancient slope failure of most probably seismic nature. The site morphology includes a pronounced scarp area, bumpy surface structures, including soil compression probably due to high pressure waves, recent rock falls and the presence of two lakes, of which one is water-filled and one ephemeral. During a field campaign in June 2017, new geophysical data in form of seismic and electrical tomographies (SRT, ERT) combined with ambient noise recordings (HVSr) was collected. In addition to that, a surface model was created with imagery gained by repeated UAV flights of the site. The combination of both, geophysical surveys of the shallow subsurface as well as remote sensing techniques enables the creation of a precise 3D surface as well as subsurface model. With these kind of models, the comprehension of possible generation processes of such old sites as the Eagles’ Lake failure becomes more approachable and can be used as basis to further analyses.