



Spectral analysis of the Namarunu volcanic complex in the Northern Kenya Rift

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The Namarunu volcanic complex, situated on the western side of Suguta Valley in the northern part of the Kenya Rift, is dominated by trachytic and basaltic volcanics with a Pliocene to Holocene age range. The analysis of ASTER satellite imagery with special focus on the VNIR and SWIR bands covering a wavelength from $0.5\mu\text{m}$ to $2.4\mu\text{m}$ provides the possibility to distinguish these different volcanic rock types by means of spectral characteristics. The visualisation of calculated ratio bands also shows a distinct gradient within alluvial fans and scree surrounding Namarunu, indicating varying source areas. Based on this satellite information, samples both from in-place volcanics and from the enclosing fans were taken for additional spectral analysis. With hyperspectral lab measurements, high resolution spectra of the rock samples were acquired. These spectral signals allow establishing a basic provenance analysis of the fans. Due to limitations of the spectral characteristics of volcanics, the spectral rock classification additionally depends on alteration patterns.

As Namarunu itself is active since at least 0.87 Ma, its volcanic rocks comprise the latest history of the Rift Valley, including rift tectonics and the influence of lacustrine environment, thus the superimposed climate fluctuations; the analysis of the fans delivers an further insight into the volcanic evolution in Suguta Valley.

Presented are the possibilities and limitations of the technique that uses the connection of remote sensing data and field samples, as well as the approach to comprehend the volcanic history of Namarunu with the help of spectral analysis.