



Remote sensing of thermal state of volcanoes in Turkey and neighbouring countries using ASTER nighttime images

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Ongoing studies are increasingly revealing that Holocene and historical activity has been reported for many of the Anatolian volcanoes. So far, hydrothermal activity have been observed on Nemrut, Tendürek, Ağrı (Ararat), Hasan dağ and Kula. Fumaroles, steam vents, steam/gas emission and zones of hot grounds have been reported. Thermal state of Anatolian volcanoes have been investigated using ASTER nighttime satellite imagery. We have analyzed the nighttime thermal images of Ağrı, Akça, Çandarlı, Erciyes, Gölcük, Göllüdağ, Hasandağ, Kula, Meydan, Nemrut, Süphan and Tendürek volcanoes in Turkey and Demavand and Nisyros volcanoes in the neighboring countries. In order to quantify the current thermal state of the volcanos studied, we have used ASTER Thermal Infrared spectra. Several ASTER nighttime images have been used to calculate land surface temperature, surface thermal anomaly and relative radiative heat flux on the volcanoes. Following the atmospheric correction of thermal images, temperature and emissivity have been separated and then land surface temperature have been calculated from 5 thermal bands. Surface temperature images have been topographically corrected. Relative radiative heat flux have been calculated using corrected surface temperature data, emissivity, vapor pressure and height-dependent air temperature values. These values have been correlated with ongoing activity observed on active Indonesian volcanoes Sinabung, Semeru and Bromo Tengger. (This study have been financially supported by TUBITAK project no: 113Y032).