

Spectral emissivity and temperature maps of the Solfatara crater from DAIS hyperspectral images

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Abstract

Quantitative maps of surface temperature and spectral emissivity have been retrieved on the Solfatara crater at Pozzuoli (Naples) from remote sensing hyperspectral data. The present study relies on thermal infrared images collected on July 27, 1997 by the DAIS hyperspectral sensor owned by the German aerospace center (DLR). The Emissivity Spectrum Normalization method was used to make temperature and emissivity estimates. Raw data were previously transformed in radiance and corrected for the atmospheric contributions using the MODTRAN radiative transfer code and the sensor response functions. During the DAIS flight a radiosonde was launched to collect the atmospheric profiles of pressure, temperature and humidity used as input to the code. Retrieved temperature values are in good agreement with temperature measurements performed in situ during the campaign. The spectral emissivity map was used to classify the image in different geo-mineralogical units with the Spectral Angle Mapper method. Areas of geologic interest were previously selected using a mask obtained from an NDVI image calculated with two channels of the visible (red) and the near infrared respectively.

Keywords

hyperspectral data; surface temperature; spectral emissivity; ara (Phlegraean Fields); DAIS

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References

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
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