COMPENSATION FOR SUB-PIXEL ROUGHNESS EFFECTS IN THERMAL-INFRARED IMAGES

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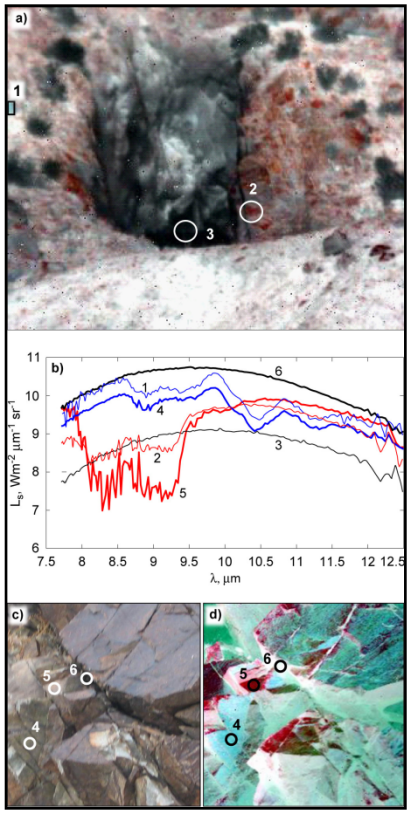
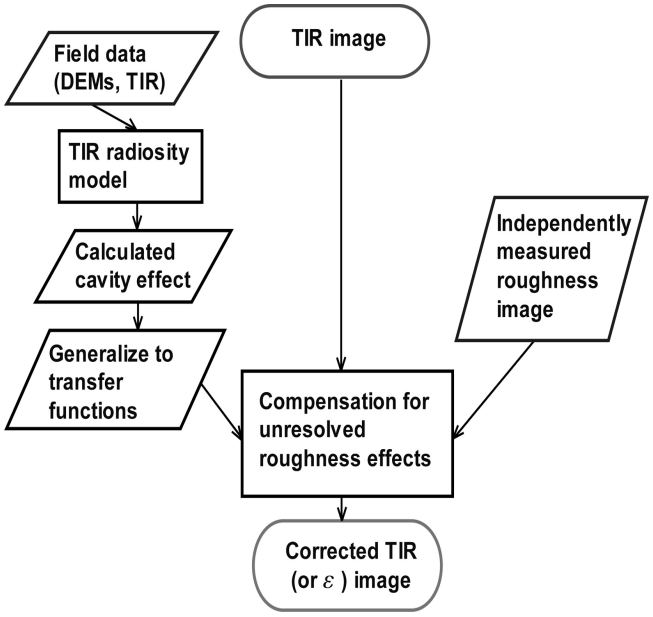
"Cavity effect":



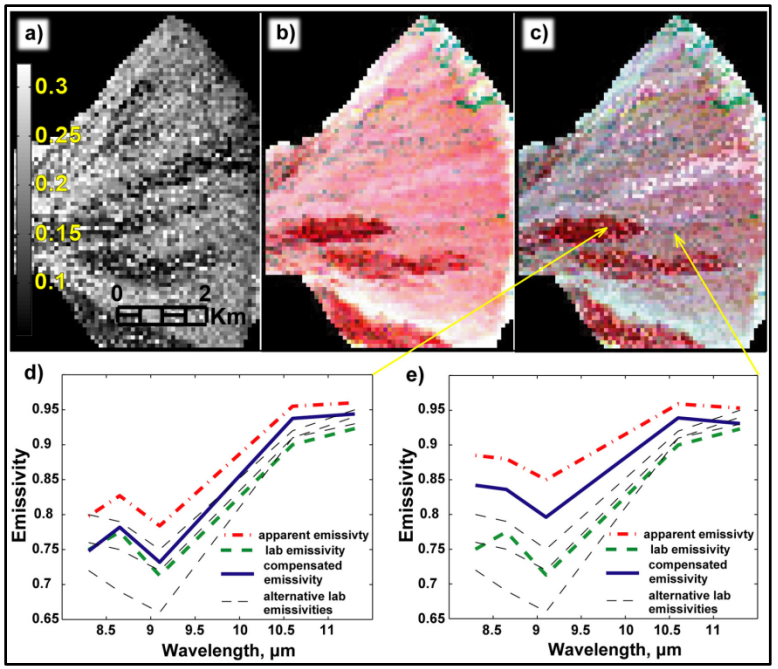
Telops, Inc., Hyper-Cam TIR data, Owens Valley, CA, USA (range: ~25 m). a) False-color image ~10 m across (RGB= 10.87, 8.59, 8.26 mm). b) Radiance spectra of schistose (1) and quartzite (2) wall rocks, the adit (3), schistose (4) and quartzite (5) parts of a 1 m rock fallen from the cliff, and deep cracks in the rock (6). c) Photo of the rock (range: ~9 m; image is ~80 cm across). d) False-color TIR image of the same rock (RGB same as in *a*).

Approach:



Flow chart illustrating approach to compensation for sub-pixel roughness effects in TIR images.

Copensation:



a) ASTER nadir- and aft-looking NIR ratio image for Trail Canyon fan calibrated to RMS roughness measured at test sites (two-look method). b) ASTER emissivity image for the same region (RGB = 10.6 μm, 9.1 μm, 8.65 μm). c) Emissivity image compensated for cavity effect (RGB = 10.6 μm, 9.1 μm, 8.65 μm). d) Cavity compensation for QG2 pixel (RMS = 0.2 m). e) Cavity compensation for QG3 pixel (RMS = 0.37 m). Yellow arrows indicate location in the compensated image of the pixels used in examples (d, e).