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Soil humidity monitoring using MODIS HKM and 1KM bands

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16 of the all 29 channels of the MODIS instrument with 1 square km surface resolution are measuring in the 3.5-15 micron wavelength interval, where the emitted terrestrial radiation is dominating. The regions of 3-5 microns and 8-12 microns are atmospheric windows, where radiation has little interaction with atmospheric gas particles.

The amount of emitted radiation of an ideal black body can be calculated using the Planck's function. In the reverse case, measuring the emitted radiation in a certain wavelength region we can calculate the temperature of a black body. An important parameter of this heat transmission system is the soil moisture. Estimating all parameters to a MODIS pixel, such as the aerosol optical depth, land surface temperature, vegetation density (namely the leaf area index) and the soil moisture, we can compile maps of these parameters. Mapping of soil moisture from MODIS data is based in this approach in our method.

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