Measurement and simulation of evaporation coefficients with multi-spectral and multi-temporal reflectance. (A03-wu185821-Poster)

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Abstract:

The ability to remotely detect changes in soil moisture is very valuable in resource water monitoring and management. The changes vary with different soil textures. A 16-band spectral radiometer is mounted on a customized frame in the field to measure and quantify dynamic variations in soil spectral-radiometric properties. Changes in soil surface radiometric properties are associated with the process of evaporation, particularly the changes during the transition time from atmosphere-limited to soil-limited evaporation. The rate of changing radiometric properties at the soil surface is extrinsically related to soil water status and implicitly related to soil hydraulic and thermal properties. Also we tried to extract dependent soil line, instead of independent soil line from the multi-spectral and multi-temporal measurements in the evaporation process. Using the transition time as a time-scaling parameter and multi-spectral reflectance in the most sensitive spectrum domain associated with the soil line, and combining the Penman-Monteith equation, an analytical algorithm to calculate evaporation coefficients of bare soils is developed, which can be applied to estimate the latent heat component in the surface energy partition.

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Presentation Information:

Presentation Date: Tuesday, November 12, 2002
Presentation Time: 1:00-3:00 pm

Poster Board Number: 540

Keywords:
reflectance, evaporation, remote sensing