



Improving the description of hydrological processes by means of advanced modeling theories and remote sensing tools

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The present work addresses the issue of supporting water and land use management in water scarce areas by assessing possible stress conditions (including drought events). To this end, investigating moisture exchange processes at the land surface-atmosphere interface is required. Controlled by a series of complex factors ranging from climate to environmental conditions, these processes are influenced also by the interactions between hydrological regimes and land use / cover patterns. Under this frame, the characterization of the land surface through the observation of its radiative and emittance properties provides the rationale for using Remote Sensing techniques. In particular, the use of vegetation and moisture indicators as well as surface temperature measurements from high-resolution multi-angular, multi-band satellite observations in combination with advanced dual-source (soil-vegetation) modeling theories provides ground for improving reliability of numerical water balance simulation models. The preliminary results presented, obtained following this synergistic approach, prelude significant advancements in the monitoring of hydrological regimes, providing future means to support the management of conflicting human and environmental water demands under increasing scarcity of freshwater resources.