A Two-source Energy Balance Model for estimating evapotranspiration over an olive orchard in a semi-arid region of Morocco

Jamal Ezzahar (1), Abdelghani Chehbouni (2,5), Salah Er-Raki (3), Ghizlane Aouade (3), Said Khabba (4), Olivier Merlin (5), Gilles Boulet (5), and Lionel Jarlan (5)

(1) Ecole Nationale des Sciences Appliquées, Université Cadi Ayyad, Safi, Maroc, (2) Institut de Recherche pour le Développement, Maroc, (3) Faculté des Sciences et Techniques, Université Cadi Ayyad, Marrakech, Maroc., (4) Faculté des Sciences Semlalia , Université Cadi Ayyad, Marrakech, Maroc,, (5) Centre d'Etudes Spatiales de la BIOsphère (CESBIO), Toulouse, France.

In arid and semi-arid regions, about 85% of the available water is used for irrigated agriculture, and therefore a sound and efficient irrigation practice is an important step towards achieving sustainable management of water resources in these regions. In this regard, a better understanding of the water balance is essential for exploring water-saving techniques. One of the most important components of the water balance in semi-arid areas is the evapotranspiration (ET). Therefore, a precise estimation evapotranspiration is of crucial importance for agricultural water management.
In this work, a two source energy balance model (TSEB) is used to estimate ET over an irrigated olive orchard located near located near to the Marrakech city (Centre of Morocco). In addition to its simplicity, TSEB does not require a large number of input parameters that are not readily available. Evapotranspiration and micrometeorological parameters were continuously measured during the year 2003 in order to evaluate the performance of TSEB estimates.
The comparison between daily estimated and measured evapotranspiration yielded a good agreement although the complexity of the study surface with a correlation coefficient of 0.78 and a root mean square of 61.9wm^{-2}.