

Evaluation of Wavelet Model for Estimating Evapotranspiration Using Satellite Images Data

Evapotranspiration can be as parameter effective after rainfall to determine water balance region. Having accurate estimates of evapotranspiration is essential for planning and management of water resources. For this purpose, several experimental models have been proposed to estimate evapotranspiration. In some areas of the world including Iran, density of meteorological stations for zoning this parameter is not enough. According to the spatial variability of climatic parameters and the result of evapotranspiration using remote sensing method that considers these changes is very favorable. Among the most widely used models that accurately estimate evapotranspiration using remote sensing, will be noted wavelet model. Wavelet one of the new methods in the field of signal analysis. In this regard, the purpose of present study is to evaluate and Comparison the accuracy of wavelet models to estimate the reference evapotranspiration using parameters derived from satellite images contains the Earth's surface temperature and amount of water vapor in the atmosphere. In this study, used satellite images data of four station contains Anar, Kerman, Rafsanjan and Babak to develop wavelet models and used synoptic stations data to use in the Penman-Monteith model. The required parameters for model by satellite Terra MODIS were received and using software ENVI4 / 7 and GIS 10 satellite images became the model input parameters. In this study, In the first stage, temperature parameter, in the second stage, atmosphere water vapor parameter and in third stage, both parameters simultaneously was used as the wavelet model input. According to the results we find that the wavelet model with use two parameters water vapor in the atmosphere and land surface temperature Compared to wavelet models developed with the input parameter land surface temperature or water vapor in the atmosphere on his own was more accurate The model has a coefficient of determination 90% on the training data and test. Finally, according to the coefficient of determination wavelet models developed in the different modes can be concluded that wavelet model is suitable method to estimate reference evapotranspiration using satellite imagery products.

Key words: Evapotranspiration, Wavelet, MODIS Sensor, Terra Spacecraft.



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