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Abstract

The solar rays on the surface of Earth is one of the major factor in water resources, environmental and agricultural modeling. The main environmental factors influencing plants growth are temperature, moisture, and solar radiation. Solar radiation is rarely obtained in weather stations; as a result, many empirical approaches have been applied to estimate it by using other parameters. In this study, a soft computing technique, named support vector regression (SVR) has been used to estimate the solar radiation. The data was collected from two synoptic stations with different climate conditions (Zahedan and Bojnurd) during the period of 5 and 7 years, respectively. These data contain sunshine hours, maximum temperature, minimum temperature, average relative humidity and daily solar radiation. In this study, the polynomial and radial basis functions (RBF) are applied as the SVR kernel function to estimate solar radiation. The performance of the proposed estimators is confirmed with the simulation results.

Keywords: SVR; solar radiation; sunshine hour; soft computing methodologies.

1. Introduction