Evaluation of new models to estimate the total solar radiation in the deserts of central Iran using collective intelligence

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Abstract

Solar energy is one of the most promising renewable energy sources. The values of the global solar radiation (GSR) are the most important parameter for the solar energy applications. The main objective of the present study is to apply Genetic Algorithm (GA) to estimate Global Solar Radiation over central arid deserts of Iran. To achieve this, the measured weather data for six stations, spread over the study area, were used to develop comprehensive models to estimate GSR. Monthly maximum, minimum, and mean air temperature, mean relative humidity, total sunshine hours, maximum possible sunshine duration and extra-terrestrial solar radiation were used as inputs variables and the measured global solar radiation (GSR) was used as output. The obtained results confirm the ability of the developed models to predict solar radiation values precisely.

Keywords: Solar, Model, GA

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[DOR: 20.1001.1.20089813.1389.1.2.1.2]