

## Abstract

Due to the lack of solar radiation measurement stations, prediction of solar radiation had a great interest in the recent years. In the present work, fourteen solar radiation models had been used to assess monthly mean global solar radiation on a horizontal surface. Since we observed that each model was adequate for some months of the year, one model can't be sufficient for the prediction of the whole year, that is why we proposed a smart hybrid system, based on intelligent rules, which could select the most suitable prediction model from the fourteen models listed herein. In order to test and evaluate the proposed models, the southern Algerian city; Tamanrasset was selected for this study. Five years (2000–2004) of meteorological data sets were collected from the Algerian National Office of Meteorology (NOM), and from the two spatial databases. Thus, the reached results indicated that the new hybrid model could be able to predict global solar radiation with an excellent accuracy in this location.