Forecasting Direct Normal Irradiation at Djibouti Using Artificial Neural Network

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Abstract : In this paper Artificial Neural Network (ANN) is used to predict the solar irradiation in Djibouti for the first Time that is useful to the integration of Concentrating Solar Power (CSP) and sites selections for new or future solar plants as part of solar energy development. An ANN algorithm was developed to establish a forward/reverse correspondence between the latitude, longitude, altitude and monthly solar irradiation. For this purpose the German Aerospace Centre (DLR) data of eight Djibouti sites were used as training and testing in a standard three layers network with the back propagation algorithm of Lavenber-Marquardt. Results have shown a very good agreement for the solar irradiation prediction in Djibouti and proves that the proposed approach can be well used as an efficient tool for prediction of solar irradiation by providing so helpful information concerning sites selection, design and planning of solar plants.