Complex-valued forecasting of the global solar irradiation

Author(s): Saoud, LS (Saoud, L. Saad)[1]; Rahmoune, F (Rahmoune, F.)[1]; Tourtchine, V (Tourtchine, V.)[1]; Baddari, K (Baddari, K.)[1]

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Abstract

In this paper, a forecasting of the global solar irradiation in the complex-valued domain is proposed. A method to transform the meteorological data into complex values is developed and the Complex Valued Neural Network (CVNN) is used to model and forecast the daily and the hourly solar irradiation. The measured data of Tamanrasset city, Algeria (altitude: 1362 m; latitude: 22°48 N; longitude: 05°26 E) is used to validate the developed model. In the hourly solar irradiation case, the 24 h ahead will be forecasted using the combination of the past daily meteorological dataset. Several models are presented to test the feasibility and the performance of the CVNN for forecasting either daily or hourly solar irradiation for both multi input single output and multi input multi output strategies. Results obtained throughout this paper show that the CVNN technique is suitable for modeling and forecasting daily and hourly solar irradiation. © 2013 AIP Publishing LLC.

Indexed keywords

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