



Contribution ID: 282

Type: **Poster Presentation**

Probabilistic forecasting of solar irradiance: An application to South African data

Probabilistic forecasting of medium-term global solar irradiance (GSI) using data from Tellerie radiometric station in South Africa for the period August 2009 to April 2010 is discussed in this paper. Variables are selected using a least absolute shrinkage and selection operator (Lasso) via hierarchical interactions and the parameters of the developed models are estimated using the Barrodale and Roberts's algorithm. To improve the accuracy of forecasts, a convex forecast combination algorithm where the average loss suffered by the models is based on the pinball loss function is used. A second forecast combination method which is quantile regression averaging (QRA) is also used. The best set of forecasts is selected based on the prediction interval coverage probability (PICP), prediction interval normalised average width (PINAW) and prediction interval normalised average deviation (PINAD). The results demonstrate that QRA is the best model since it produces robust prediction intervals than other models. The percentage improvement is calculated and the results demonstrate that QRA model over GAM with interactions yield a small improvement whereas QRA over a convex forecast combination model yields a higher percentage improvement. A major contribution of this study is the inclusion of a non-linear trend variable and the extension of forecast combination models to the QRA.

Apply to be considered for a student award (Yes / No)?

No

Level for award (Hons, MSc, PhD, N/A)?

N/A

Primary author: Ms MPFUMALI, Phathutshedzo (University of Venda)

Co-authors: Dr BERE, Alphonse (University of Venda); Dr SIGAUKE, Caston (University of Venda); Mrs MULAUDZI, Sophie (University of Venda)

Presenter: Dr SIGAUKE, Caston (University of Venda)

Session Classification: Poster Session 1

Track Classification: Track F - Applied Physics