



Contribution ID: 85

Type: Oral Presentation

Analysis of the temperature models for the evaluation of global solar radiation in the coastal and interior regions of South Africa.

Friday, 11 July 2014 11:10 (20 minutes)

Abstract content (Max 300 words) http://events.saip.org.za/getFile.py/a?target=_blank **Formatting & Special chars**

Solar radiation is a crucial parameter in designing solar power devices, installation of solar technologies systems and studying land surface-processes. These data are usually not available for most areas due to the lack of weather stations especially in developing countries. Estimation of global solar radiation (H) from the daily range of air temperature (ΔT) offers an important alternative in the absence of measured H or sunshine duration because of the wide availability of air temperature data. Hargreaves and Samani developed a temperature based model using maximum (T_{max}) and minimum (T_{min}) temperature data to estimate the global solar radiation, the model is given as, $H = H_0 (k_r \sqrt{\Delta T})$, where H_0 is the extra-terrestrial radiation k_r is the empirical coefficient and $\Delta T = T_{max} - T_{min}$. They further proposed that the k_r values differ from coastal and inland regions by 0.19 and 0.16 respectively. In the current study the validation of k_r value has been performed for the coastal and interior regions of South Africa. The average yearly mean bias error (MBE) and root mean square error (RMSE) have been calculated for different stations over the period of five years. The results will be discussed in the presentation.

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

No

Level for award (Hons, MSc, PhD)?

NO

Would you like to submit a short paper for the Conference Proceedings (Yes / No)?

Yes

Primary author: Dr MALUTA, Eric (University of Venda)

Co-authors: Mr NEMANGWELE, Fhulufhelo (University of Venda); Mrs MULAUDZI, Sophie (University of Venda); Prof. SANKARAN, Vaith (University of Venda)

Presenter: Dr MALUTA, Eric (University of Venda)

Session Classification: Applied

Track Classification: Track F - Applied Physics