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A comparative study of the three empirical solar models in North West, South Africa.

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Abstract content
 (Max 300 words)
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Energy crisis in South Africa (SA) is causing a lot of problems for every one and it has a negative impact on the growth of our economy. There is a dire need to implement the 2020 strategies to harness renewable energy and evidently it needs the knowledge of the amount of solar energy falling in different areas of SA. With this knowledge the renewable energy systems can be meaningfully developed so as to sustain the outdoor conditions. The use of pyrheliometers, pyranometers, etc., to measure direct, global, etc., also plays an important role. However they cannot be installed in many areas due to lack of funds, the alternative method is to estimate these irradiances. It is of a vital importance that a model to be selected should give a reasonable estimate. This paper gives a comparative study of three modified empirical solar radiation models (Angstrom; Hargreaves & Samani and Glower & McCulloch) on a horizontal surface from sunshine hours and temperatures of different stations in North West (-25.8080° ; 25.5430°). A five year meteorological data from the four ARC stations were used to estimate the global solar radiation for this region. The estimated monthly solar irradiance data was compared with observed data using the statistical parameters such as, the mean bias error (MBE); Mean percentage error (MPE) and root mean square (RMSE). The Angstrom and temperature based models give better estimations for North West province.

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YES

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

PhD

Main supervisor (name and email) and his / her institution

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