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Calculating solar irradiance to determine yield from solar cells for De Aar

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Abstract content
   (Max 300 words)
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Solar energy harvesting is a growing industry in South Africa. De Aar is a favoured location for solar power stations, as it has high potential yield and is close to some of South Africa's largest power lines. This paper uses standard methods of solar irradiance estimation to calculate the potential yield with respect to wavelength for De Aar. It is necessary to take wavelength into account as light is not extinguished uniformly with respect to wavelength. De Aar was chosen for this paper because there are many years of total surface irradiance data available and some data for irradiance in specific wavelength bands. Comparison of these values with actual data collected in De Aar and calculated by PVGIS was done to determine the accuracy of these models for the conditions in De Aar. These estimations where done for a typical midsummer's day and a typical midwinter's day. A standard silicon photovoltaic cell response curve is used to calculate the energy harvested from these estimations. The model solar panel orientation is varied to find the optimum fixed orientation for a solar panel. This was compared with the optimum orientation calculated for De Aar by PVGIS.

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Level for award
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MSc

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

Professor Hartmut Winkler, hwinkler@uj.ac.za, University of Johannesbrug

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Yes

Primary author: Mr WEBBER, Graham (University of Johannesburg)

Co-author: Prof. WINKLER, Hartmut (Dept. Physics, University of Johannesburg)

Presenter: Mr WEBBER, Graham (University of Johannesburg)

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