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Reproducing observed solar radiation characteristics in Rwanda using theoretical models

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Abstract content
   (Max 300 words)
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Special chars

In this paper we discuss the framework for developing a theoretical model that characterises solar radiation at ground level in Rwanda. Such a model would also assist in determining the feasibility of employing solar power in that country. We explore the results of previous studies that have provided broad band solar irradiance measurements at specific locations, and that have developed empirical relationships between a series of solar parameters appropriate for conditions in that part of Africa. We seek to reproduce these relationships using a theoretical modelling approach that incorporates radiative transfer processes, as well as Rayleigh and Mie scattering. This paper presents an overview of the methodology and calculations required for such a study, including the effect aerosols and water vapour have on irradiance. We present wavelength-dependent techniques that characterize the various components of solar radiation using theoretical models, and evaluate their suitability in this context. The application of Monte Carlo based atmospheric radiative transfer models is also briefly discussed.

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Yes

Level for award
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PhD

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

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