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Contribution to the Relationship Between Solar Radiation and Sunshine Duration in the Tropics: A Case Study of Experimental Data at Ilorin, Nigeria

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Abstract: From monthly average daily values of clearness index and relative sunshine spanning a period of two years, two equations (linear and quadratic) of the Angstrom-Prescott model have been developed for the estimation of global solar irradiation at Ilorin (Lat. 8°32'N, Long. 4°34'E), a tropical location. Comparison of the regression coefficients of the linear type model showed that the values are quite consistent with those quoted in the literature for the Tropics. The predictive efficiencies of these two models are also compared with those which are believed to be applicable globally, and those developed for the Nigerian environment. Although some of the models seem fairly adequate for this location, their predictive efficiencies in terms of Mean bias error (MBE), mean absolute bias error (MABE) and root mean square error (RMSE) are poorer than those models developed in this study. Everything, therefore, seem to point to the fact that the Angstrom-Prescott model, whether in a linear or quadratic form, is locality dependent.

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