

ESTIMATION OF HOURLY GLOBAL SOLAR RADIATION INCIDENT ON INCLINED SURFACES IN IRAQ AT DIFFERENT SKY CONDITION

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ABSTRACT

The location of Iraq within the mid latitudes made it one of the places which receive large quantities of solar radiation. Due to the global trending of investing this energy and for environmental, healthy and economical considerations, there are great opportunities to construct projects that invest the solar energy to generate power in Iraq, which requires providing models specialized in locating the spatial and temporal distribution of the incident solar radiation on the inclined surfaces to provide more solar energy. In this study a mathematical program has been proposed by using MATLAB by using two kinds of models isotropic and an isotropic to locate the spatial and temporal distribution hourly solar radiation incident on inclined surfaces at latitude (25° - 40°) and longitude. (35° - 50°), considering the inclination angle is the optimum angle at all times. It shows the possibility of having more solar energy on the inclined surface compared with the horizontal surface; the difference was obvious in the months (January, February, March, October, November and December). The models mentioned above were also used in determining the spatial and temporal distribution of the incident solar radiation on the inclined surface under different sky conditions (clear, semi-cloudy and cloudy) above Iraq and the neighboring countries, it indicates that the difference in the solar energy between the three conditions is larger in January and December compared with other months.

KEYWORDS: Solar Radiation, Inclined Surfaces, Isotropic Model, an Isotropic, Optimum Angle