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SIMULATION IN A SOLAR PROCESSES: CASE STUDY, ESTIMATION OF A SOLAR RADIATION

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ABSTRACT

The use of simulation methods in the study of solar processes is relatively still in progress. Numerical modeling and simulation are tremendously advanced when coupled with last developed computer programming languages. Typical computer simulation methods are used for solar process such as thermal performance of a solar water heater, solar saline water distiller, thermal model of a house heating systems. This work presents a theoretical study of the solar radiation intensity. The study is conducted using Sabratha city localization and condition in Libya. A MATLAB algorithm was developed to estimate the direct and diffuse radiation intensity where the total energy intensity was obtained. The algorithm was validated using available experimental data for the same localization and conditions from the literature. A MATLAB algorithm was used for a parametric analysis of the design and environmental conditions that effect the model equations authenticity. A MATLAB software has a very powerful tool to represent a result in a graphical or tabulated form. A plot MATLAB function was used to construct a nice graph of the obtained results. The highest solar irradiation for a clear day was around midday reaching a value of 700 watt.

Keywords: solar water heater, A MATLAB algorithm