

Design and Application of Grey Predictor for Unglazed Transpired Solar Collector

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Abstract- In order to evaluate different modeling techniques for Unglazed Transpired Collectors (UTC), not only mathematical modeling method for UTC based on heat transfer expressions to estimate the various heat transfer coefficients for the UTC components and empirical relationship, but also grey predicting approach have been designed and introduced, in this study. Thermal performance experiments of UTC have been carried out on an optimized experimental setup. Firstly, obtained experimental results have been compared with the mathematical model. To constitute a common point, output temperature of the UTC has been selected as the output variable. Then, a grey predictor has been used to forecast the output temperature with higher accuracy with the aid of simple mathematical equations. Finally, obtained results have been compared and comparison results have been illustrated in both graphical and tabular form. Grey predictor is the simplest method to forecast the output temperature with high accuracy.

Keywords- *Solar heating, grey modeling, grey predictor, unglazed transpired collectors.*