

## Modelling of a solar desiccant cooling system using a TRNSYS-MATLAB co-simulator : a review

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### ABSTRACT

Heating and cooling systems around the globe are the largest energy consumer and with the ever-increasing population and development the need for heating and cooling systems is increasing. Control systems in solar assisted desiccant cooling are especially important as they allow the solar fraction to be increased when paired with thermal storage. Low cost efficient thermal storage methods are also important in increasing the efficiency of solar assisted desiccant cooling. Transient System Simulation tool (TRNSYS) simulation is presently used for estimation of energy use in building. It is targeted to include solar desiccant based evaporative cooling using MATLAB so that it can be readily used for control. Building Energy Performance Scenarios - BEPS Tools (Energy Plus, TRNSYS, ESP – r, Mathcad) do not provide sub-models for proper control mechanism. So MATLAB co-simulator could be targeted in order to control a TRNSYS simulation. The use of TRNSYS-MATLAB co-simulator as a relevant tool is discussed along with its applications for the system. A comparison of TRNSYS and MATLAB to other building energy performance simulators is then provided to evaluate the performance of solar desiccant cooling for hot and humid region.

### KEYWORDS

TRNSYS; MATLAB; Desiccant cooling; Co-simulator

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