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## Dynamic Performance of Solar PCM Thermal Storage System

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**Abstract:** The dynamic performance of a PCM thermal storage system is investigated. The most affecting parameters on the system performance are the type and properties of PCM material, and the heat transfer fluid (HTF) inlet temperature. The time variant solar collector discharge temperature and that from the heating/cooling coils due to space load variation results in time dependent HTF inlet temperature. This paper is to study the behavior of the PCM thermal storage system under such time dependent HTF inlet temperature operating condition. A simple one dimensional model were used and solved numerically using the finite difference technique . To assure stability of solution the right time step and element size were applied. A MATLAB Program is formulated and used to solve the result system of equations. Results are presented in terms of the storage tank fluid temperature profiles, effectiveness of PCM usage and capacity of the storage system . The above were calculated for the cases of constant and a time-dependent HTF inlet temperature conditions for comparison. The performance of the PCM storage system is found to be substantially different for the above two mode of operation .