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## Control design model for a solar tower plant.

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### Abstract

This paper deals with the development of a control design model for a 1MW Solar Tower equipped with a heat storage facility. This model is precise enough to achieve a good prediction of the responses but is also simple enough to avoid computational burden. The paper presents the assumptions and equations used for the different components of the plant. The behavior of the model developed in Matlab/Simulink<sup>™</sup> is qualitatively validated by closed loop simulations. The control used for these simulations is also given. It consists of two levels, the upper level being an automaton whose outputs are the set points of the lower level controllers.

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### 1. Introduction

The development of an advanced control strategy is an efficient means to improve the maneuverability of the superheated steam Concentrated Solar Power plant e.g. the performance, the reliability, the plant life consumption and the safety. The main objective for the control is to track the power demand and to limit the thermal load experienced by the main components. The design and tuning of such a control system is however particularly difficult due to the complexity of the phenomena involved in this kind of plant. Among the major concerns are the non linearity and the coupling between the variables which make the system highly complex. To deal with such a process a model is thus mandatory to test and tune the control design before an on-site implementation.

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