

Weather Sensitivity Of Physically Based Model Of Residential Air-Conditioners For Direct Load Control: A Case Study

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Summary

In most electricity systems the residential sector is one of the main contributors to system peaks. Hot and humid summer seasons lead to a significant proportion of the supplied power being used on air-conditioning. In this work, we address the identification problem of the parameters of an aggregated elemental physically based model representing a housing unit with an A/C system. The identification is done to validate the model using a pilot house equipped with an independent air conditioner system. An online maximum likelihood based-identification algorithm is developed. The required hardware and system instrumentation are detailed. A sensitivity analysis study of the model for variations in humidity and solar radiation is also reported. Results reveals that the physically based model succeed to capture the effect of the outdoor weather conditions. The equivalent model identified under different humidity and ambient temperature represents the real load perceived by the utility.

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