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Modified Approach for Predicting the Temperature in Residential Premises

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Abstract:
This article presents a modified approach to predicting the temperature in residential premises in order to minimize the financial costs of a household for electricity. The approach is based on the numerical solution of simple differential equations. The temperature change is considered as a time series. This time series is modeled by a simple differential equation of a special type. Determining the coefficients in the form of the differential equation makes it possible to predict future temperature values. The presented approach makes it possible to operate with a large set of parameters, which makes it widely applicable in forecasting, both in engineering practice and in other areas. The software product Matlab was used for the needs of the research.

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I. Introduction

The determining factor that is a prerequisite for managing energy systems in residential premises is energy efficiency. Energy consumption in residential buildings contributes to a large part of the overall energy consumption in industrialized and developing countries [1]. The operation of most types of household appliances, lighting, heating, ventilation, air conditioning, and refrigeration on electricity and this contributes to significant CO2 emissions. In order to stabilize the release of CO2 into the atmosphere, recent studies [2], [3] suggest significant changes in annual CO2 emissions associated with electricity consumption, a reduction of 60% between 2020 and 2070.

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