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TRNSYS validation of a study on building's energetic evaluation in north of morocco

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Abstract

The study is done on an apartment of 85 m2, located in Tangier. A south facing façade receives a continuous sunshine all day. The outer walls are hollow brick Double skin spaced from an air knife (10 cm), the inside walls consist of simple dividers, while the ceiling and floor are concrete 30 cm thickness.
The aim of this study is to evaluate the hygro-thermal behavior of a multi-zone apartment located in northern Morocco by using the TRNSYS16 software, and compares its results with those from a study with CODYBA software and to estimate the heating load in January and the air conditioning load for the month of august.
Meteorological data and building materials properties are those used in the north of Morocco.

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Keywords: Energy simulation, comfort heat, air temperature

1. Introduction

Morocco is poorly endowed with energy resources and imports over 96% of the energy it consumes. 36% of the overall energy consumption goes to the residential and tertiary sector, the housing sector emits more than 30% of greenhouse gas (GHG) emissions responsible of global climate on global warming. The increasing of the standard of living, and the availability of heating and air conditioning equipment at low prices, thus everyone has the possibility

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of heating in winter and cooling in summer. While the majority of existing electrical networks in some urban areas are not designed for these power calls, which weakens them.

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In addition, the demand for electricity could quadruple by 2030. The aim of this study is to compare the simulation results of two TRNSYS16 and CODYBA software. The study is to make a hydrothermal simulation of a local multi-zone and estimate the heating load for the month of January and the air conditioning load for the month of August.

2. Parameters used

2.1. Description of the local studied

The study is done on a flat in the city of Tangier in northern Morocco, with an area of 85m². A south-facing façade receives a continuous sunshine throughout the day; the plan of the apartment is on (figure1)

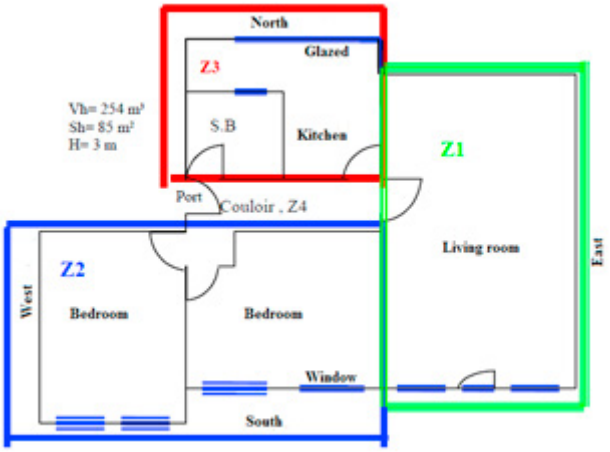

Figure1: Plan of the apartment studied

The exterior walls are brick Hollow double skin spaced from an air knife (10 cm), the interior walls are consisted of simple dividers, while the ceiling and the floor are concrete 30 cm of thickness. The structure construction in northern Morocco exterior walls appears on (figure2).

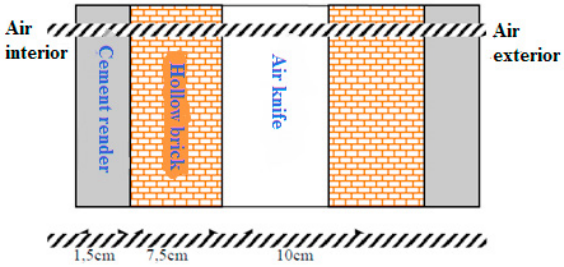

Figure2: Structure of an external wall

2.2. Weather data

Meteorological data were measured on the Tangier weather site over the two years 2003 and 2004.

2.3. Building materials used in northern Morocco