ESPr – LIGHT CONSUMPTION SIMULATION

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This article deals with intelligent lighting which forms a specific subsystem of intelligent buildings or constructions. The aim of the experiment is to evaluate the suitability of different algorithms for lighting simulation in ESP-r tool and to compare the power consumption of "classical" and "intelligent" lighting. From these two traditional control approaches is more realistic the one, which is using a simulation of human presence and the intelligent one, which uses calibration.

Open-source program ESP-r is a sophisticated tool that is developing at the University of Strathclyde in Glasgow. It represents a simulation environment for general use which supports in-depth assessment of the factors that affect energy consumption and environmental performance of buildings.

The evaluation of simulation showed that software tools that are designed to simulate intelligent systems are very helpful in solving specific problems of various subsystems of the building. Designers can evaluate the control system already in the proposal process.

When we consider the price of 1 kWh of electricity as approximately 0.063 €, the cost savings will be only € 16 per one year. From this result can we conclude that an intelligent lighting control for smaller homes or workplaces only increase comfort of occupants or users. The real savings, which return of investments about 10-15 years can only be achieved in case of larger homes or buildings.

Keywords: ESPr, intelligent lighting, simulation of energy consumption
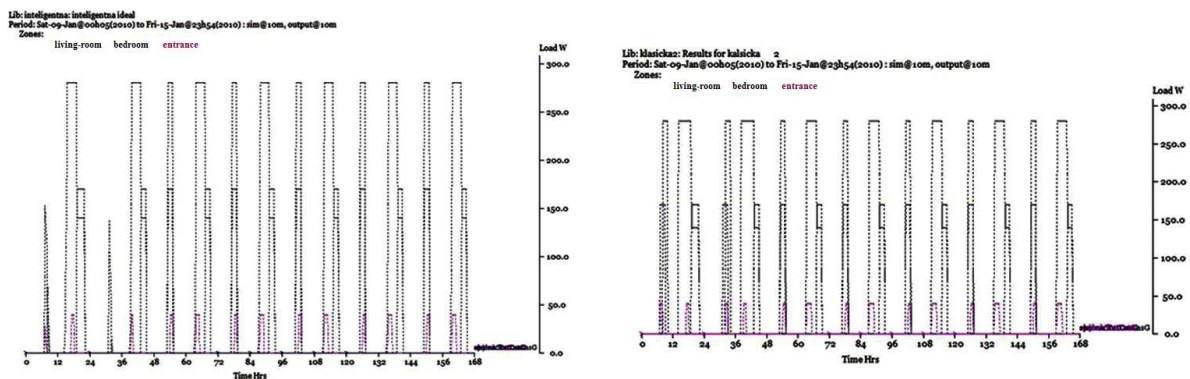

Fig. 1: Results for ideal intelligent control in the chart (left), for the classical control chart (right)