

Development of a system of automatic adjustment of artificial lighting for the optimized utilization of daylighting

Aim of this research project is the development of an automated lighting dimming system with the use of a new designed photosensor for the optimal exploitation of daylighting aiming at greater energy savings within the installed lighting system in various types of buildings.

According to the international bibliography the efficiency of the responsive daylight systems in real buildings differs considerably. The actual energy savings are smaller than the calculated and simulated results. The low efficiency of these systems is the main barrier for the widest use of most of them. The main objectives of this project are focused in the following points:

- Collection, tracking and study of all existing systems with photosensors and their control algorithms.
- Investigation of ways of their improvement and selection of the most energy efficient technologies.
- Investigation of parameters that determines the proper placement of the photosensor in the roof.
- Development of a methodology for the adjustment of the optical field of view of the photosensor.
- Development of a prototype photosensor.
- Experimental and theoretical study of the proposed new system.
- Improvement of techniques of lighting simulation in regards the calculations of energy savings.
- Development of a model for controlling the luminous flux in an artificial lighting system, the optimization of the spatial response of the new designed photosensor as well as its placement in the room.

