



Study of the flicker and the stroboscopic effects of lighting products

The main objective for the project is to design and assemble an optical setup for characterization of flicker and/or stroboscopic effect in modern, solid-state light (SSL) sources. The project is a collaboration between KTH and the Swedish Energy Agency “Energimyndigheten” in Stockholm.

The possibility to modulate, at a high frequency, the light intensity in luminaries (that is, lamps) is an important advantage of SSL sources. For example, in optical fiber communication, the modulation speed defines the rate of the transmitted data. While, in some industrial applications, the modulation of the light intensity from luminaries is required, in other like lighting applications, it can change our perception of the environment in a negative way. In fact, in our daily life, the perceptible modulation of light is undesired and can even lead to health and performance issues. Therefore, the lighting products currently available on the market need to be tested for both flickering and stroboscopic effects. The flickering effect describes light modulation which can be directly observed, while stroboscopic effect can only be seen when illuminating a moving or rotating object. In general, both effects indicate a poor-quality lighting.

The project contains both engineering and research parts. It will include building the setup, collecting data, as well as doing numerical analysis and finding the best procedure for characterization of light sources. An investigation of whether or not a typical flicker measurement setup can, in addition, measure LiFi (visible light communication) modulated light sources will also be included.

Part of the project will be performed at the Swedish Energy Agency in Stockholm using analog detectors, and part will be done at the Albanova Quantum Electronics and Quantum Optics lab using single-photon detectors.

The thesis can be written either in Swedish or in English.

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