

The Effect of Luminance Pattern on Nighttime Discomfort Glare Response - CRADA 653 (Abstract)

CRADA #653 (PNNL #82730, 82985)

August 2024

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Abstract

Light Emitting Diode (LED) adoption is critical for widespread energy savings from commercial outdoor lighting systems. A complaint from the public, concerns glare from LED light fixtures especially those with exposed LED arrays. This human factor study will examine luminance uniformity of the fixture aperture to identify parameters related to this response. The outcome will inform optical design by lighting manufacturers, retaining LED energy efficiency while mitigating glare. The results may also lead to improved industry standard glare metrics for lighting. Pacific Northwest National Laboratory's (PNNL) Lighting Science and Technology Lab in Portland OR has a purpose-built apparatus with exposed LED arrays that have been used for prior work. It can easily be adapted for use in this experiment. Interchangeable templates will allow changing patterns for the stimulus. Glare ratings from the recruited subjects will be analyzed and reported in a peer-reviewed journal for application by luminaire manufacturers for improved products. The McClung Foundation's interest is to better understand human perception of lighting, leading to more comfortable and effective visual environments. Members of the Foundation's Technical Review Committee will be instrumental in reviewing the experimental design, analysis, and the final report. They will also help disseminate information about the results within the lighting community.

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