

# ASSIST recommends...

# Assessing Direct Perception of Flicker

The Alliance for Solid-State Illumination Systems and Technologies (ASSIST) has proposed a new method for measuring and quantifying direct perception of light source flicker. The publication, *ASSIST recommends... Recommended Metric for Assessing the Direct Perception of Light Source Flicker*, provides specific measurement procedures and calculations to objectively determine whether the amount of flicker from a light source is above or below the threshold of human perception. The metric is applicable to any waveform shape and frequency and is based on peer-reviewed laboratory and human factors experiments.

## Goal of the Metric

The increasing popularity of solid-state lighting has led to a renewed interest in light source flicker and methods of measuring and quantifying flicker. Compatibility of LED lamps with dimming circuits designed for incandescent lamps is of particular concern regarding flicker. Existing metrics (percent flicker and flicker index) describe aspects of the physical waveform but do not relate it to human perception, nor do they include the frequency of the flicker, which is important to determining its perception.

The goal of ASSIST's proposed flicker metric is to give manufacturers and other stakeholders a tool for measuring and quantifying their lamp designs for flicker perception. Calculation of the metric starts with a relative light output waveform measurement and finishes with a single numerical result indicating whether the amount of flicker is above or below the perception threshold. Additionally, the result can be expressed as a probability of a viewer being able to detect flicker from a light source. Laboratories can easily create their own test setups based on this method to quantify the amount of direct flicker produced by a light source.

## Publication

Bodington D, Bierman A, and Narendran N. A flicker perception metric. *Lighting Research and Technology*, advance online publication 13 April 2015; doi: 10.1177/1477153515581006



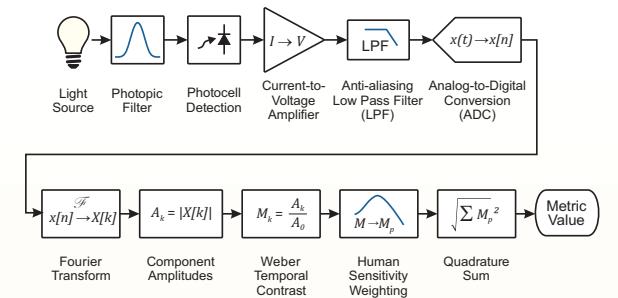
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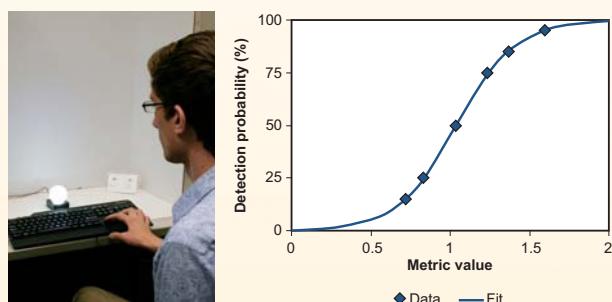
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Order of steps to measure the light waveform and compute the proposed flicker metric.

## Validation

To validate the metric, 220 different waveforms were tested in a human factors experiment with 10 subjects to determine the flicker observation rate of each waveform and the metric's ability to predict the observation. The metric also was used to predict the flicker perception of five previously untested commercial A-lamps. The flicker metric development and validation results are described in "A flicker perception metric," published by *Lighting Research and Technology*.



(left) A subject views the flickering light source as displayed for human factors testing of the metric. (right) Relationship between flicker detection probability and the metric value.

## For Free Download

The ASSIST recommends publication may be downloaded from:

<http://www.lrc.rpi.edu/programs/solidstate/assist/recommends/flicker.asp>



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