What's New in LightTools

Upgrade your illumination optics designs

Introduction

LightTools 2025.03 delivers tools that expand modeling, simulation, and analysis capabilities for a wide range of optical design applications.

Phosphor and Quantum Dot Modeling

When specifying properties for a phosphor material, you can now specify the distribution for converted rays, and as well as two additional distribution types for unconverted rays. These features enhance the modeling of quantum dots in LightTools, which is beneficial for fine spectral tuning in light emitting diodes (LEDs), fluorescent lamps, cathode ray tubes, and plasma displays.

Imaging Analysis with Modulation Transfer Function

For forward simulations, you can specify a Modulation Transfer Function (MTF) mesh for an illuminance analysis to evaluate imaging performance. This enables you to analyze ray data and assess contrast at a given frequency.

Luminance Camera

You can now configure a spatial luminance device as a pinhole camera for visualization to efficiently generate spatial luminance images to evaluate color, uniformity, and brightness.

HUD Utility

The new head-up display (HUD) utility supports:

- Luminance analysis with backward simulation to ensure the image is bright and uniform
- Ray path analysis for ghost and stray light
- Virtual image rendering and scenery
- Sun loading and eye discomfort analysis

KEYSIGHT

Birefringent Coatings

LightTools now offers a birefringent coating user-defined optical property (UDOP) to model a thin layer of birefringent material. This feature is particularly useful for augmented reality (AR) / virtual reality (VR) designers applying birefringent coatings to headset viewing surfaces.

Expanded Example Model Library

The LightTools Example Model Library is an excellent resource for learning how to use specific features and application examples to jumpstart design workflows. The library includes new examples for human tissue modeling, freeform lens for UV sterilization, and stray light analysis.

GPU Acceleration for FullWAVE FDTD

The 2024.09 release introduces GPU acceleration for the FullWAVE finite-difference time-domain (FDTD) solver, significantly enhancing simulation speed. Utilizing modern NVIDIA graphics processing units (GPUs) with Compute Unified Device Architecture (CUDA) 12.3 or higher, this feature delivers up to 91 times faster performance compared to traditional central processing unit (CPU) computations. This acceleration enables users to efficiently tackle large-scale and complex simulations, reducing computation times, and boosting productivity.
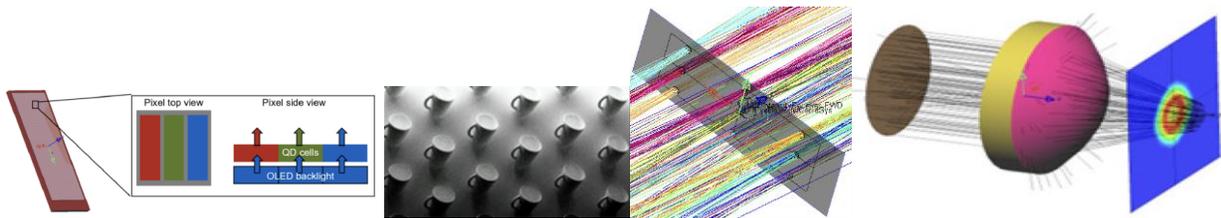

Figure 1. What's new in LightTools