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Photon Engineering, LLC Announces FRED™ 4.100

TUCSON, AZ., September 23, 2005 -- Photon Engineering, LLC announces Release 4.100 of its optical engineering software FRED 4.x series. FRED is an advanced optical engineering software program capable of simulating the propagation of light through virtually any optical/mechanical system. The FRED 4.100's release features faster (up to 50x) raytracing of 3rd and higher order NURB surfaces, ultimate flexibility in defining and creating astigmatic diode sources, enhanced output of color images using gamma correction, upgraded release of the FRED incorporated BASIC compiler with new runtime error diagnostics, improved options to display angular intensity and many new script commands.

The faster raytracing is due to a new algorithm that ray traces higher order NURB surfaces much more quickly. FRED users can expect up to a 50x increase in ray tracing speed when tracing systems with 3rd or higher order NURB surfaces.

FRED 4.100 now has the capability to correctly define Laser Diode source through a simple source dialogue that includes the functionality to describe the source in terms of angular divergence around both axes, and with axial separation of the astigmatic foci defined per wavelength.

Several changes were made to the true color image feature. Output RGB images are now gamma adjusted, consistent with the specification of the sRGB color space. The image is now normalized by the max luminosity before conversion to RGB, eliminating a problem of color

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channel saturation that could occur if source power was high enough. Image brightness is now adjustable and luminosity can be displayed in the chart. In connection with these changes, RGB colors in bitmap sources and those synthesized directly are now assumed to be in sRGB color space.

Photon Engineering, LLC is a privately held company based in Tucson, AZ, and was founded in 1997. Photon Engineering is committed to providing the highest quality optical engineering services and software to its customers. Photon Engineering has worked with over 100 US and European customers on a very wide range of optics-related projects including light pipes, illumination systems, LCD projectors, space satellite systems, laser scanners, tactical optics, and zoom lenses. For more information see the company's Web site at www.photonengr.com.

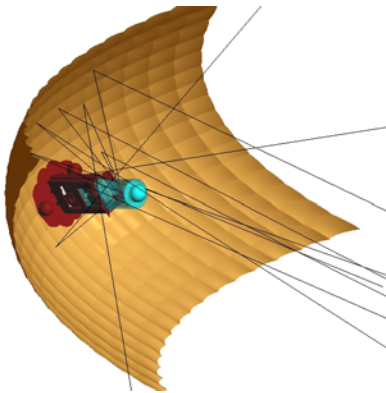


Figure 1 – Signal lamp Nurb surface with standard automotive bulb as modeled and traced in FRED.