WE LASER
THE NEW INDUSTRY

ARTICLE

FYLA white laser is the new alternative to obtain a sun simulator

A solar simulator is a device that emits a spectral radiation approximating natural sunlight**. It is employed in dermatology mainly to perform the photo tests in order to determine erythemal doses, to characterize solar cells, to test sun screen and other materials and devices.**

The construction of the solar simulator is quite complicated. **Not only the intensity of the light source must be considered, but also the spectral response.**

It is possible to use several types of lamps as the light sources within sun solar simulators. Xe light sources are generally used, since their spectral behaviour is closer to that of standard solar radiation, but they are quite expensive. Alternatively, you can try to couple multiple LEDs of different wavelengths, but this is also quite complicated if you really want your spectrum to match the solar spectrum and may require some optical work; one of the most common options is to use halogen lamp, in this case the flow may be similar but the spectral distribution is a little different.

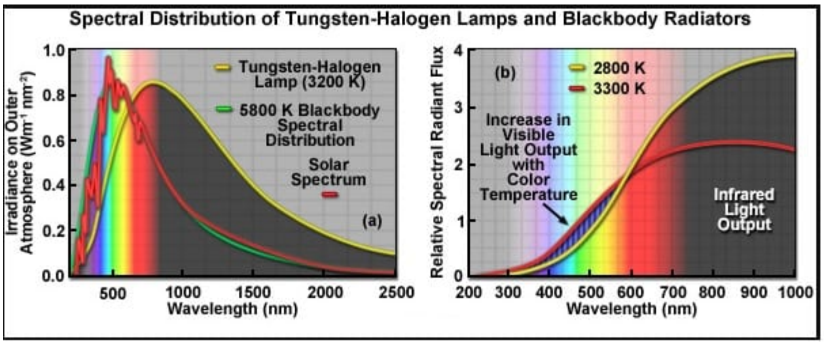


Figure 1: Tungsten halogen lamp spectrum distribution used for solar simulator

In recent years it has been demonstrated that a supercontinuum laser it is a better device to obtain a virtually perfect imitation of standard solar spectra.

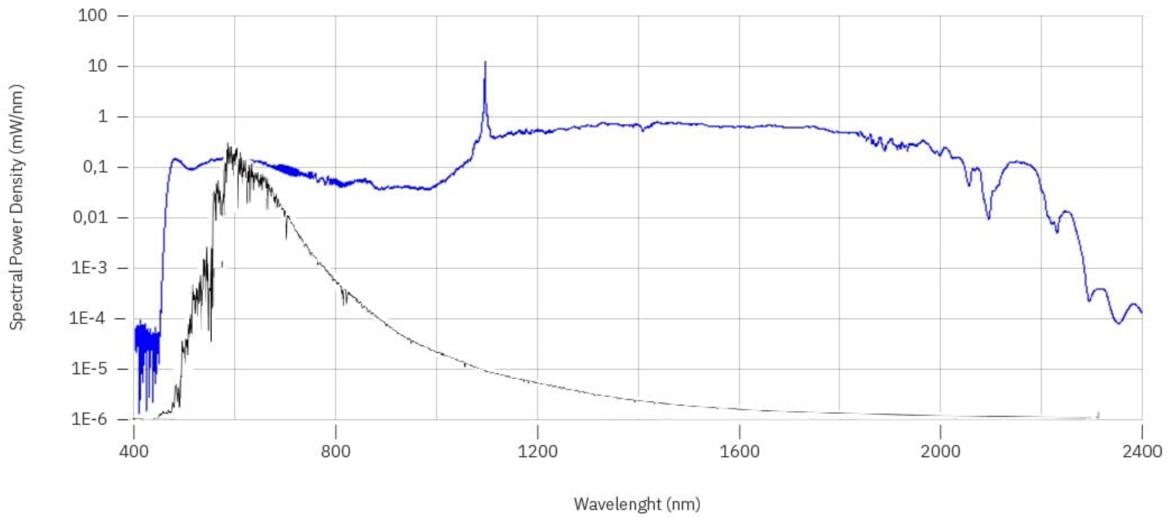


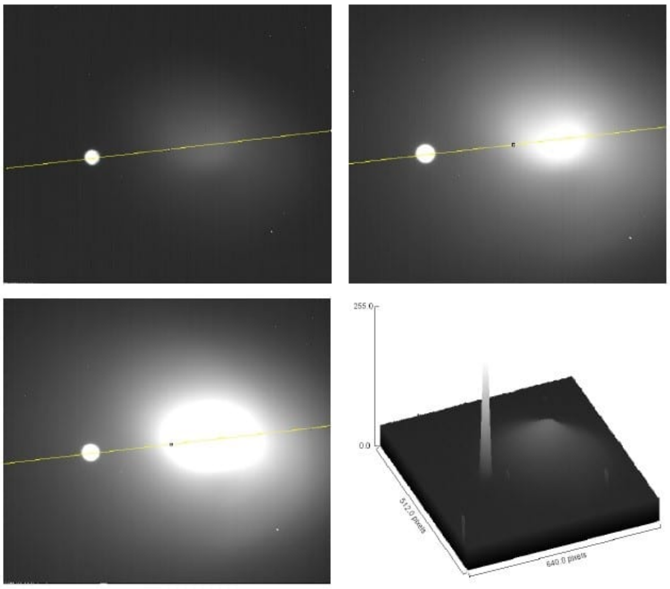
Figure 2: Comparison between solar spectrum (black line) and supercontinuum spectrum (blue line)

AIDO (Technological Institute of Optics, Color and Image), in the experimental test, compare our SC 500 with a halogen commercial source, based on a 50W tungsten halogen bulb built into a dichroic reflector on which is applied a layer of gold, to increase emissivity in the infrared is used. In order to evaluate the performance of both sources, a sensitive camera was used in the short wave infrared (900-1700nm).

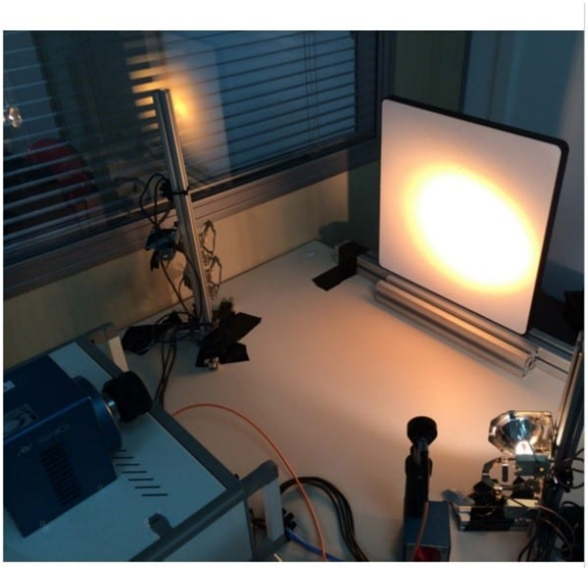
The experimental procedure followed consisted in capturing different images in the shortwave infrared (900-1700nm) using a "Xeva" camera, and the comparison of the two spots of light from the morphological point of view and intensity. For this, a sweep was performed in the integration time of the camera, from 10 to 50 microseconds, with integration times of 10 ms, 15 ms, 20 ms, 25 ms, 30 ms, 35 ms and 50 ms.

The results is that illumination of FYLA’s SC500 source has a higher emittance in the range of interest that the tungsten halogen source. In fact, all measurements in different integration time, have generated saturation in the sensor. It also notes a very good location spot of the whip of FYLA’s SC500 (with a very fast decay at all times of integration).

BELOW: pictures taken from left to right, top to bottom, of the integration times of 10 ms, 30 ms, and 50 ms as well as a 3D seeing the power density obtained with 0,5W (FYLA) becoming hugely superior that a 50W halogen lamp.



BELOW. The layout created for the Laboratory test comparison.



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