

### Abstract

Surfaces in VirtualLab are usually smooth. In contrast, real surfaces are always rough to a certain degree. This application scenario explains how measured data of a real surface can be imported from an ASCII file and how the resulting scattering can be analyzed in VirtualLab.

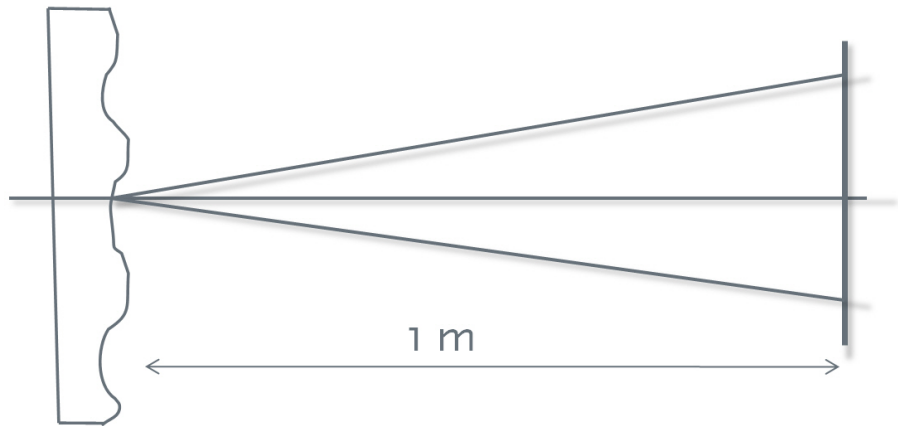
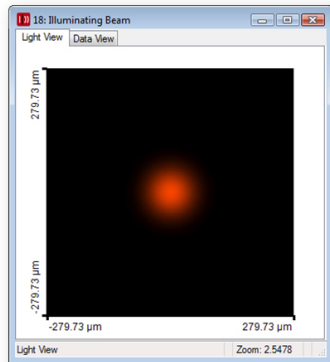
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<b>Keywords:</b>	scattering, diffraction, rough surface
<b>Requirements:</b>	VirtualLab version 4.5.0 or higher – <b>Starter Toolbox</b>
<b>Scenario Version:</b>	1.2
<b>Sample Files:</b>	Corresponding files can be found <a href="#">here</a> .
<b>Related Scenarios:</b>	<a href="#">23.01</a> , <a href="#">87.01</a>

### Description of Sample Files

The sample data in the file Scenario\_90.01\_Scattering\_rough\_surface\_02.txt can be imported into a Sampled Interface. The steps necessary for this import are described in Scenario\_90.01\_Scattering\_rough\_surface\_Task.pdf.

In the file Scenario\_90.01\_Scattering\_rough\_surface\_01.lpd the sampled interface with the imported data has been placed in a Double Interface Component surface. It is illuminated by a small Gaussian beam (see [Fig. 1](#)). The small features lead to a distorted Gaussian beam in the far field (see [Fig. 2](#)).

## Optical System Setup

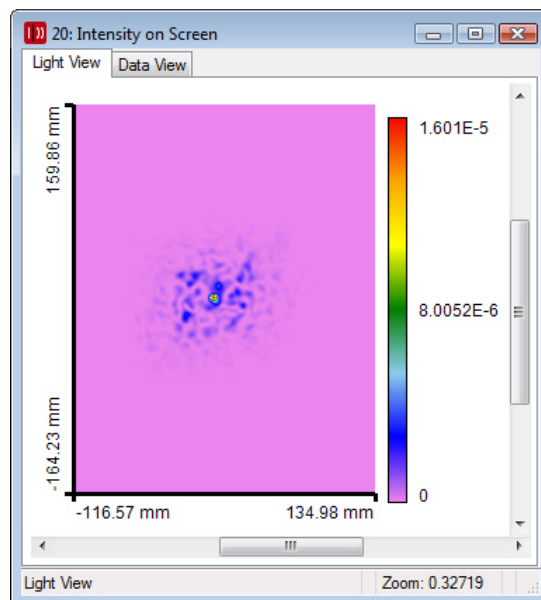


Laser beam  
100  $\mu\text{m}$  diameter ( $1/e^2$ )

Height Profile  
Fused Silica

Field on Screen

**Figure 1.** The setup assumed in the example.



**Figure 2.** Resulting field of the setup shown in Fig. 1.

## Technical Support

If you have any questions, remarks or problems concerning this application scenario, or in using VirtualLab in general, please do not hesitate to contact

us by E-Mail [support@lighttrans.com](mailto:support@lighttrans.com).

Please use the update service to install the current version of VirtualLab. Alternatively you can use the latest **Trial Version** of VirtualLab which is available at our [download site](#). If you have been registered already for an older trial version, just contact us by [E-Mail](#).

To ensure that this application scenario gives the same results as described, set the global settings to the default values. In VirtualLab this can be done in the **Extras > Global Options** dialog with the **Reset All** button.