UseCase.0051 (1.0)

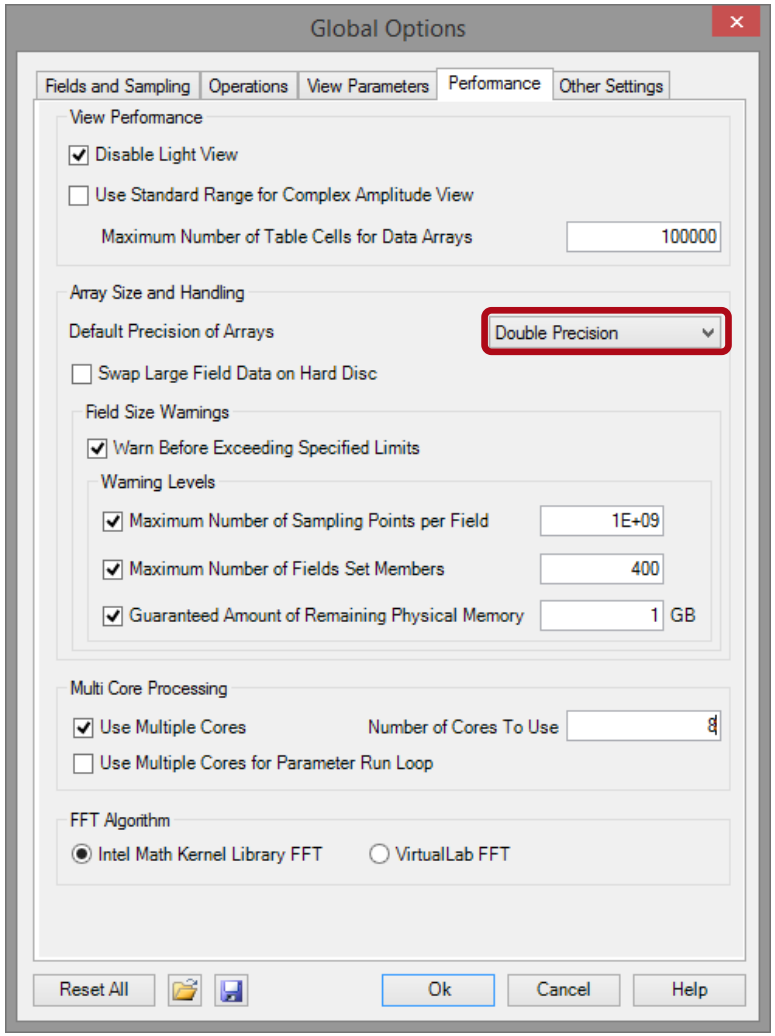
Pulse Simulation – Generation

Keywords: pulse, visualization, generator, Gaussian

Description

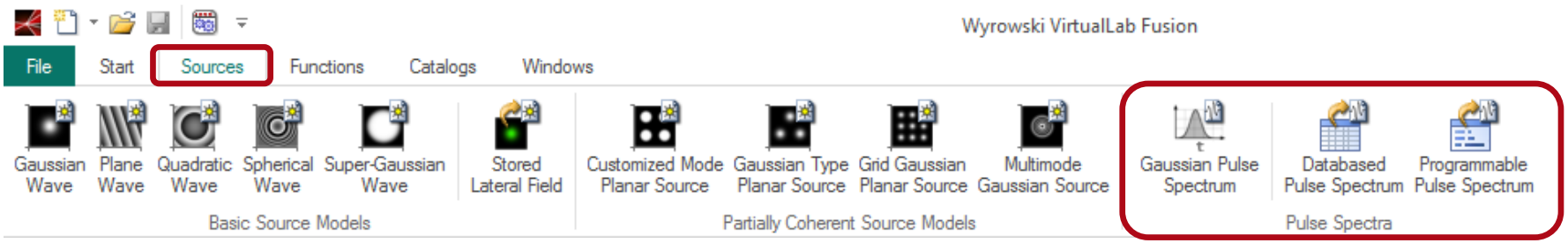
- The use case shall discuss the possibilities to define a pulse in VirtualLab.
- Different options of definition will be explained.
- Further usage of the generated pulse document to define the spectral distribution of a light source will be illustrated.

Important Reminder!



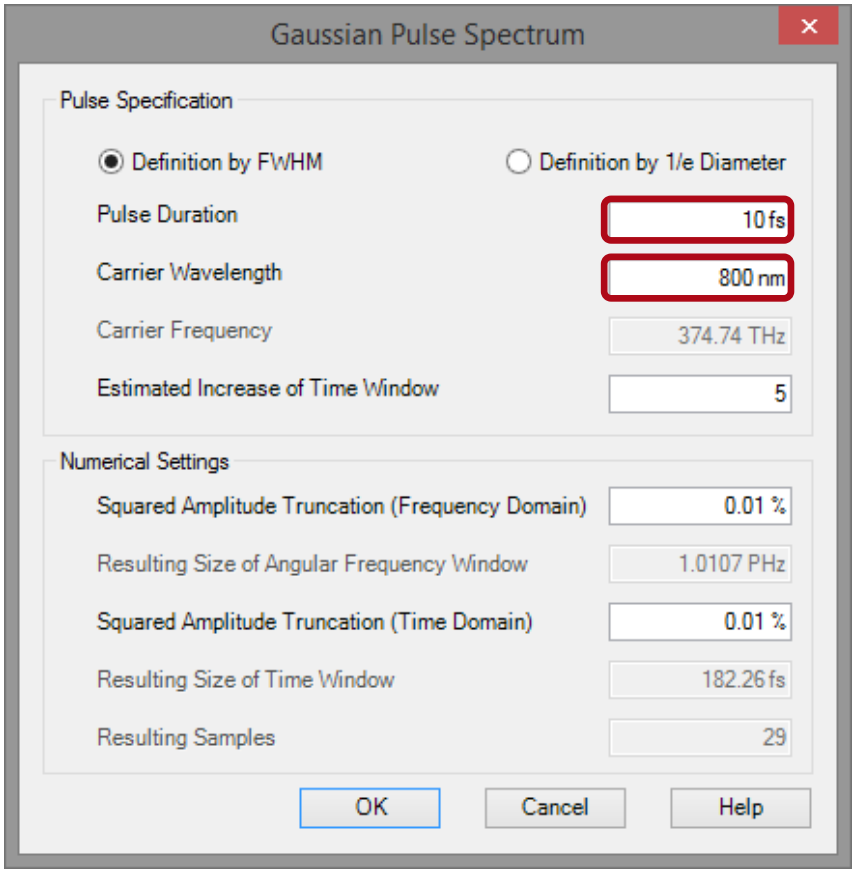
- Make sure, that for pulse modeling you have chosen Double Precision BEFORE pulse specification!
- The global options can be edited by the menu item “Global Options” in the file menu.

Pulse Generation – Generators



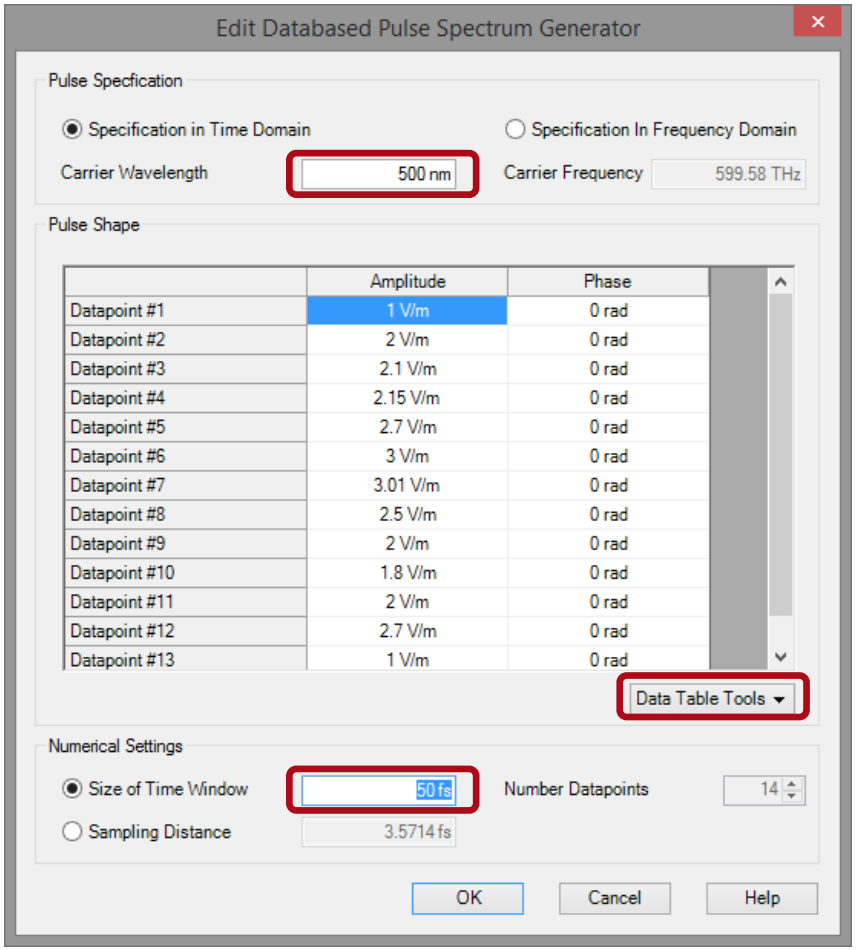
- The source ribbon of VirtualLab allow the usage of the pulse spectra generators.
- The following generators are available
  - Gaussian Pulse Spectrum
  - Databased Pulse Spectrum
  - Programmable Pulse Spectrum

Gaussian Pulse Generator



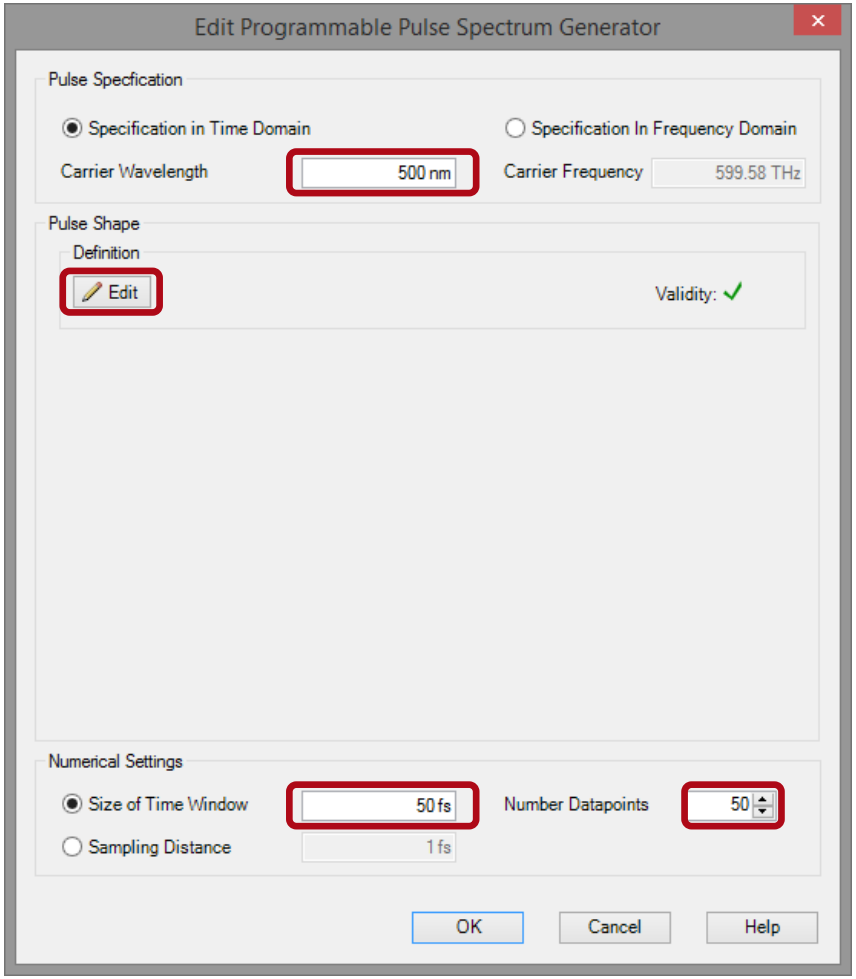
- The Gaussian pulse spectrum generator generates a pulse of Gaussian shape in the time domain.
- The user can enter the pulse duration, the carrier wavelength of the pulse and several numerical parameters (explained in detail in the manual).

Databased Pulse Generator



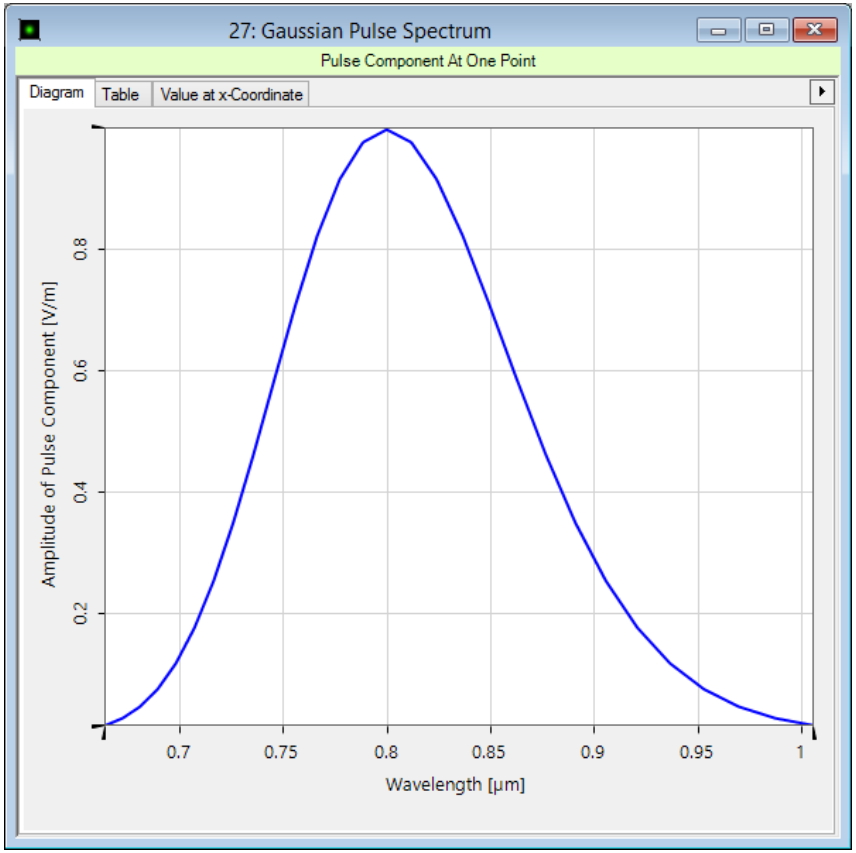
- Within the database pulse spectrum generator the user can enter data points in frequency or time domain.
- The user can specify the central wavelength and the sampling (size or distance) within the target domain.
- The data will be interpreted with linear interpolation.

Programmable Pulse Generator



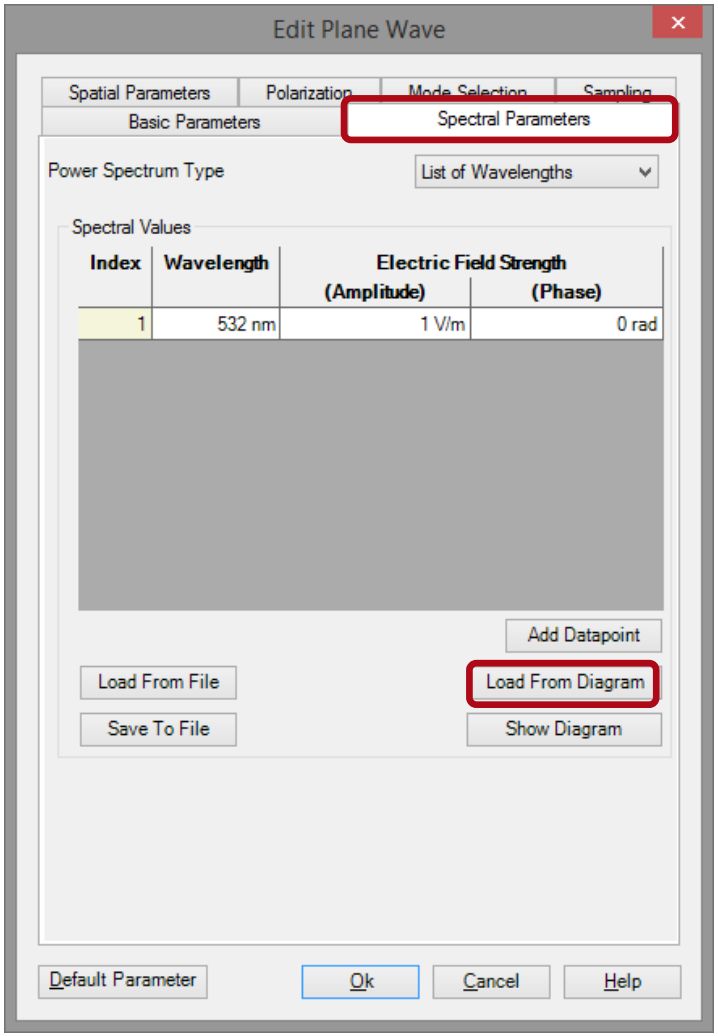
- Within the programmable pulse spectrum generator the user can enter a formula of the desired function in frequency or time domain.
- The user has to specify the central wavelength and the sampling (size or distance and number of data points) within the target domain.

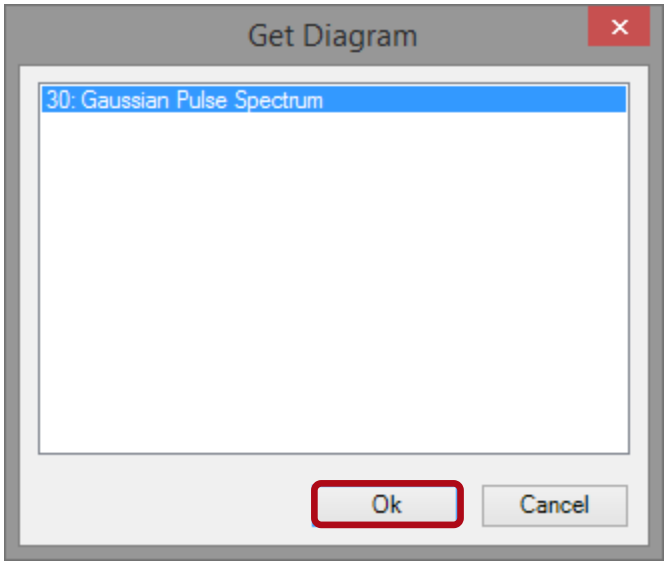
Pulse Document 1D



- The output of the pulse generator is a pulse component at one point.
- The pulse component is shown in wavelength domain (see x-axis).
- The pulse component in wavelength domain can be used to specify a spectrum of light source that shall be used for simulation.

Specification of Spectral Distribution in Source





Summary

- VirtualLab allows to specify a pulse in time or frequency domain.
- The specification can be done by
  - Pre-defined definition (Gaussian shape)
  - Database definition
  - User-defined definition (Programmable)
- The defined pulse will be generated in the wavelength domain and can be used to specify the spectral distribution within a light source of VirtualLab.