

UseCase.0052 (1.0)

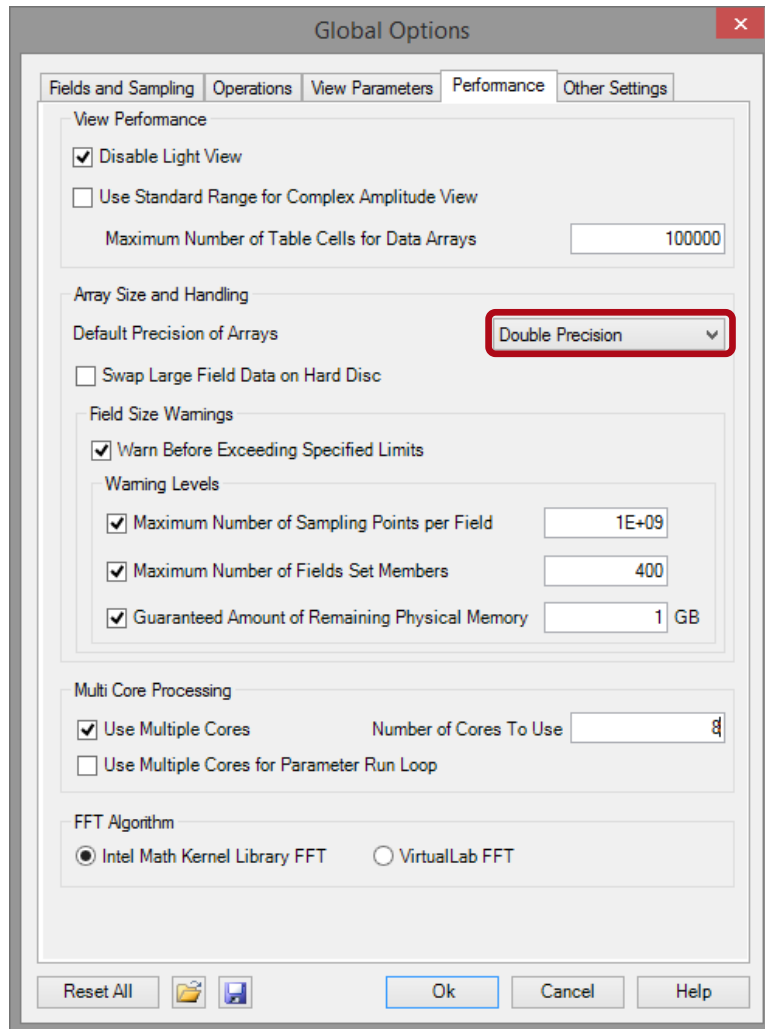
Pulse Simulation – Pulse Evaluation

Keywords: pulse, detector, spectrum, optical path length

Description

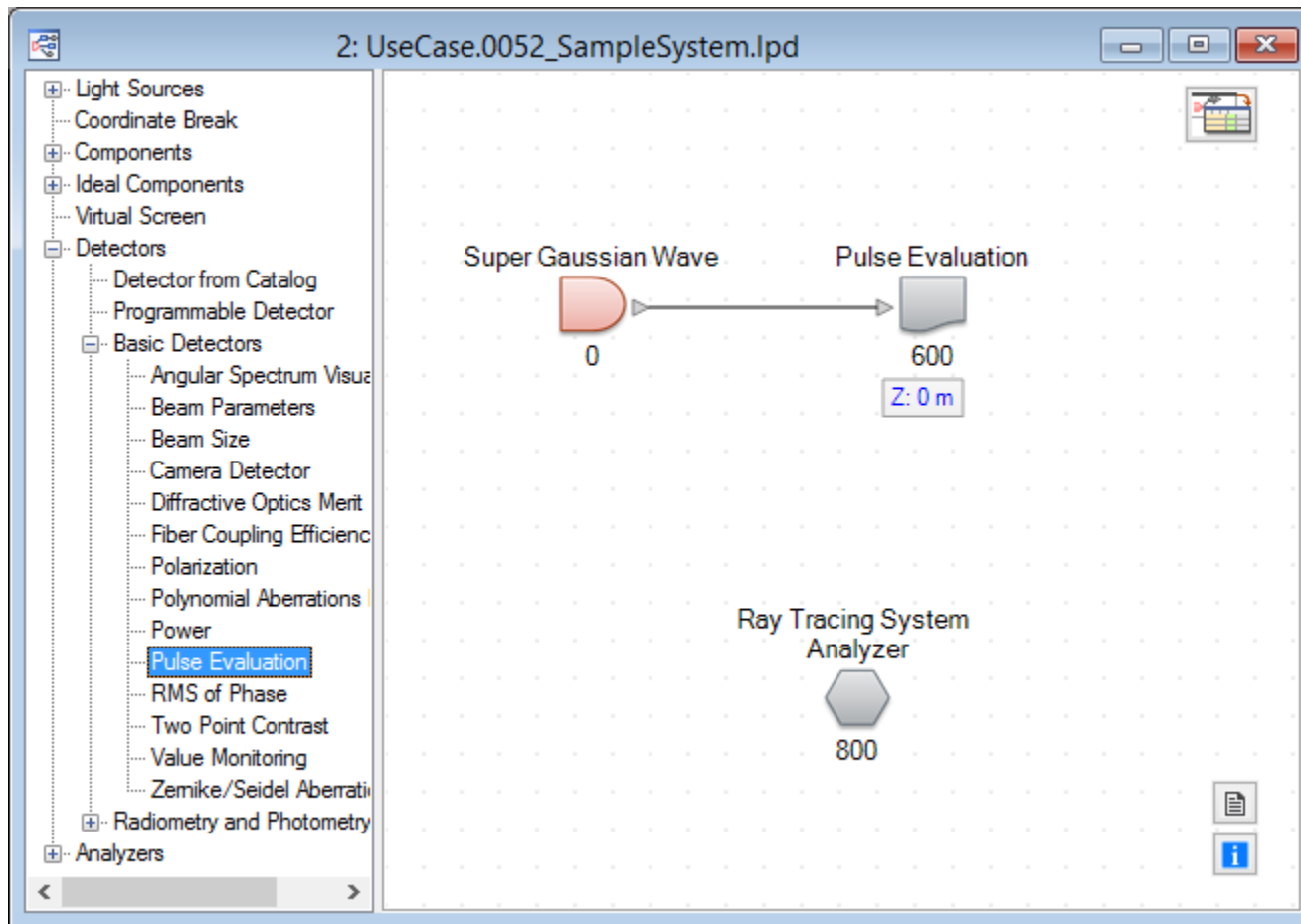
- This use case demonstrates the usage of the pulse evaluation detector.
- The pulse evaluation detector is a light path element which can be added into the light path diagram and used for the evaluation of the pulse shape.
- The detector enables the user to generate pulse information for the E_x , E_y or E_z component of the electromagnetic field.
- It is possible to generate the pulse information within 1D, 2D or 3D.

Important Reminder!



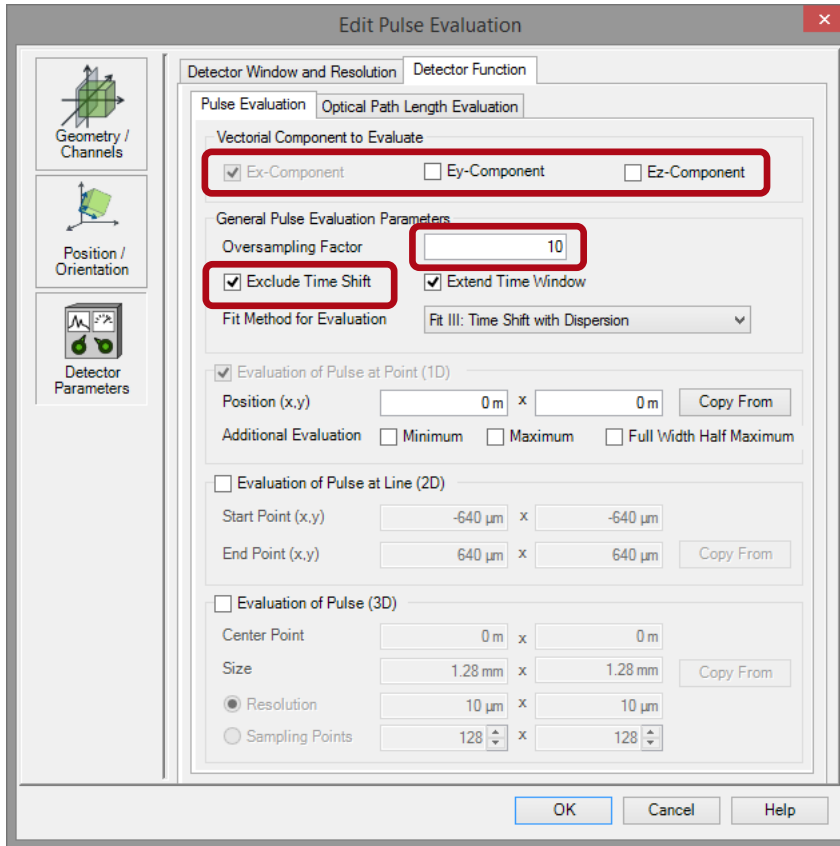
- Make sure, that for pulse modeling you have chosen Double Precision BEFORE pulse specification!
- The global options can be edited by the menu item “Global Options” in the file menu.

Sample System



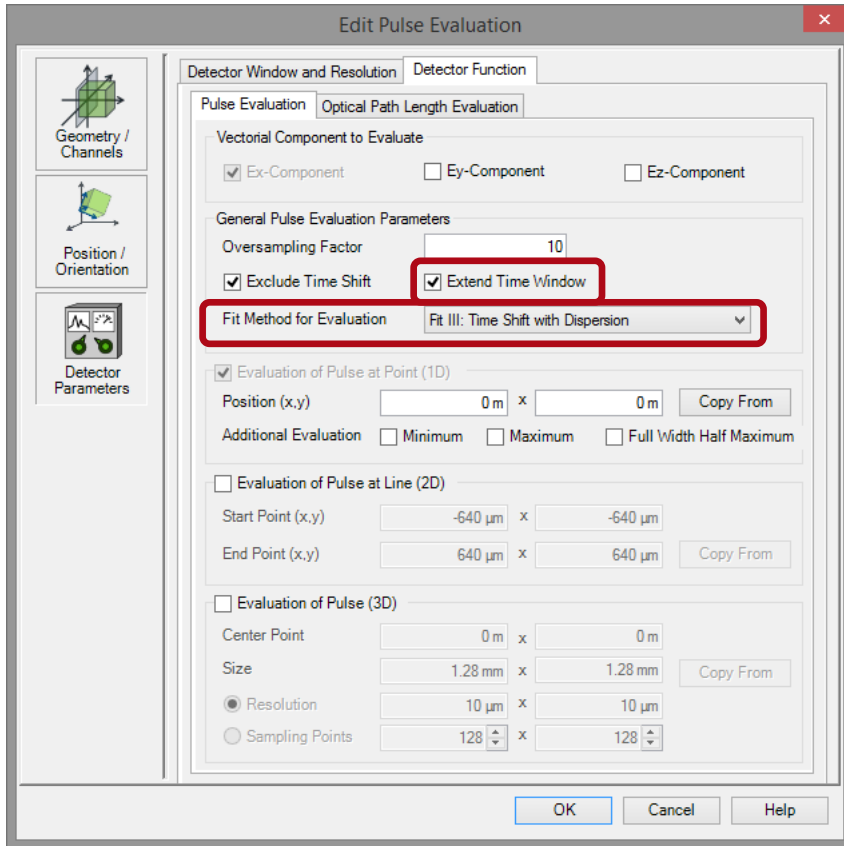
Filename: UseCase.0052_SampleSystem.Ipd

Pulse Evaluation – Edit Dialog



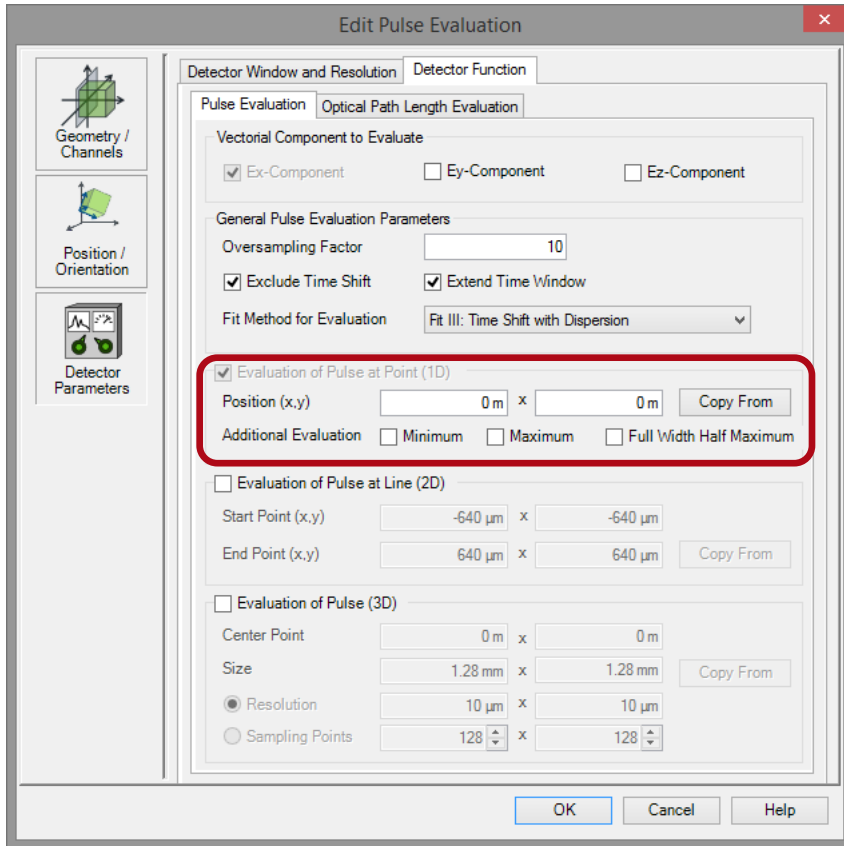
- The user can select the vectorial component to evaluate. A multi-selection is supported.
- In addition it can be configured how the pulse shall be evaluated.
- The user can specify an oversampling factor (in time domain) and whether the analytically determined shift shall be excluded.

Pulse Evaluation – Edit Dialog



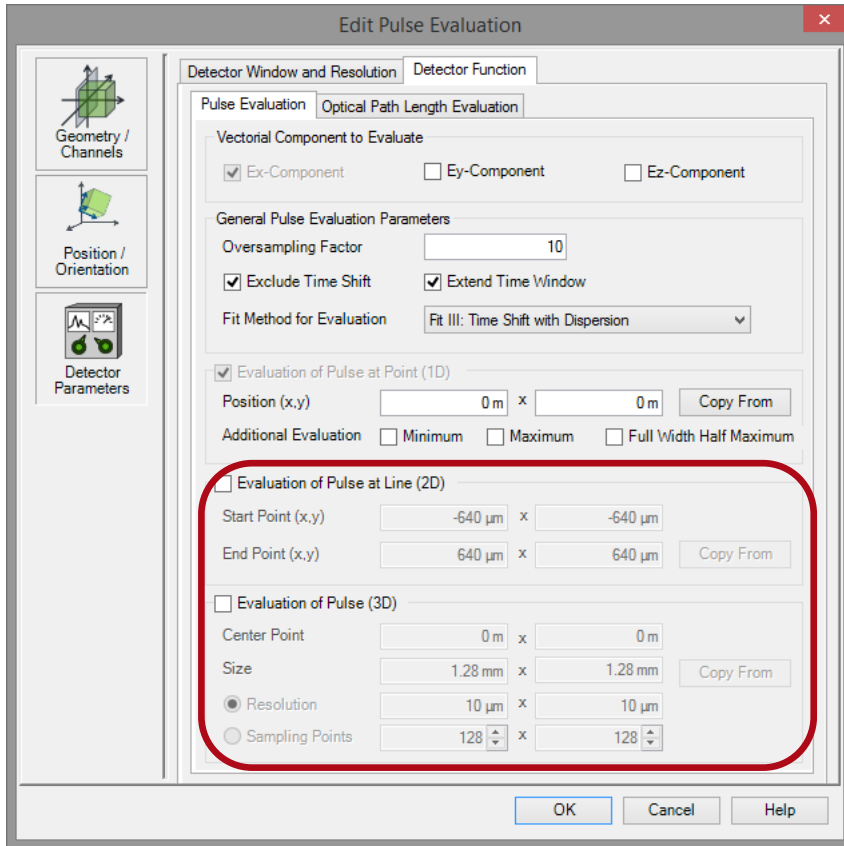
- Additionally the user can specify whether the time window shall be extended for pulse evaluation.
- VirtualLab offers an algorithm that automatize the extension of the time window.
- This algorithm is based on the evaluation of the optical path length.
- For this evaluation a fitting method can be chosen.

Pulse Evaluation – Edit Dialog



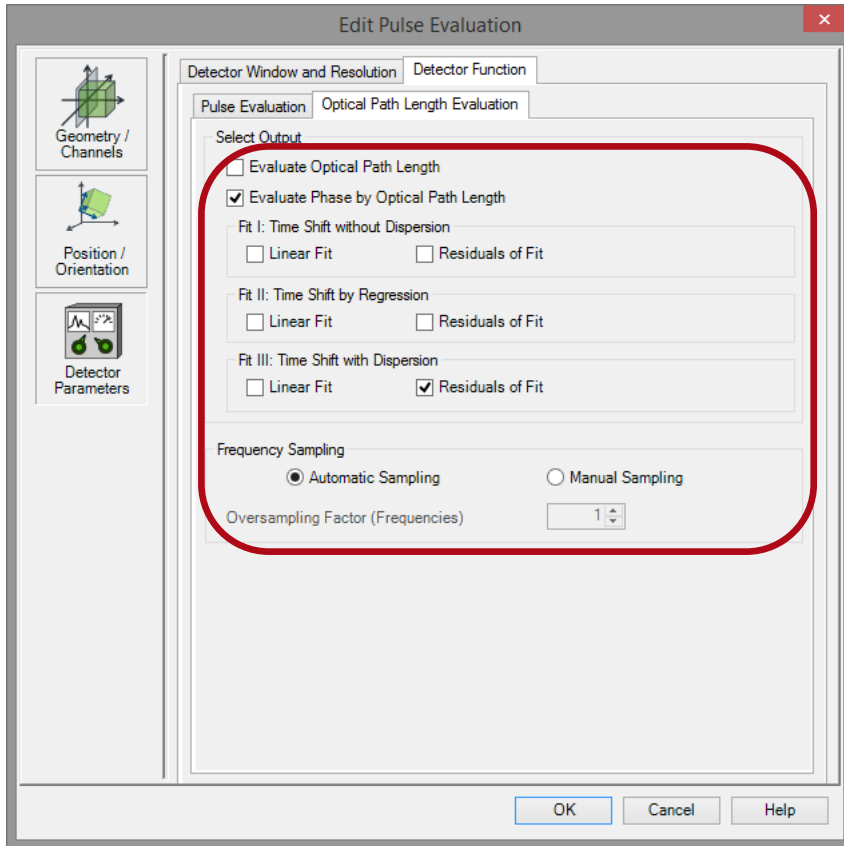
- In the bottom part of the dialog the user can select the dimensionality of the pulse information to generate.
- For 1D information the position to evaluate need to be specified. In addition some additional merit functions on the 1D pulse are available (like Minimum, Maximum and Full Width Half Maximum)

Pulse Evaluation – Edit Dialog



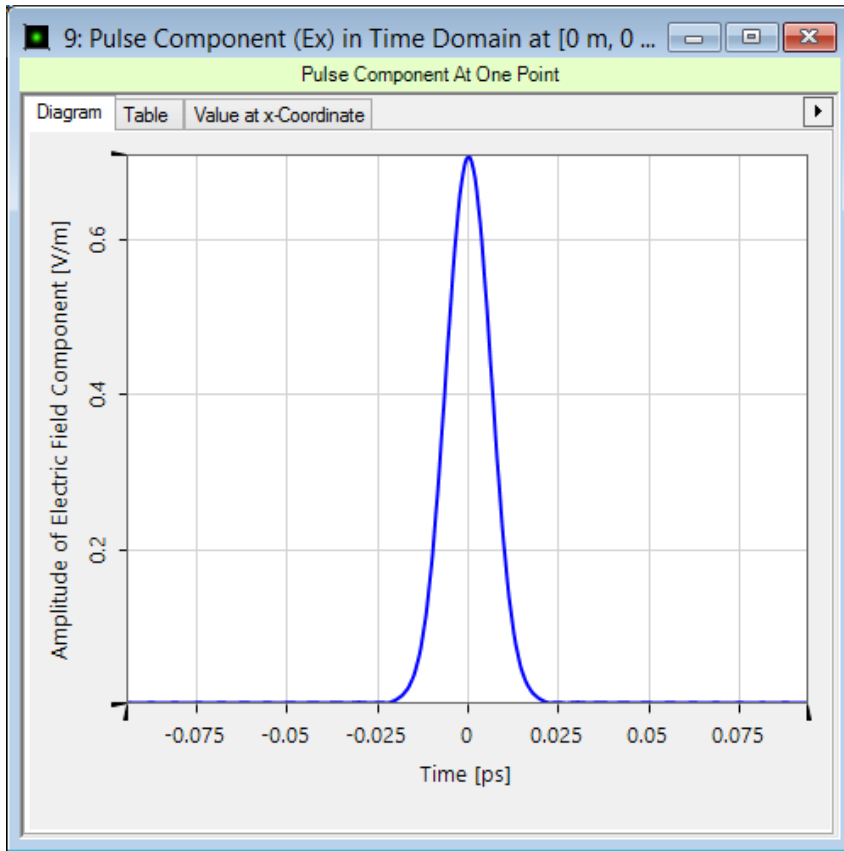
- The 2D output need the specification of the starting point and the end point which shall be used for evaluation.
- In 3D mode the user can define a rectangular area and the sampling which shall be used to generate the 3D pulse information.

Pulse Evaluation – Edit Dialog

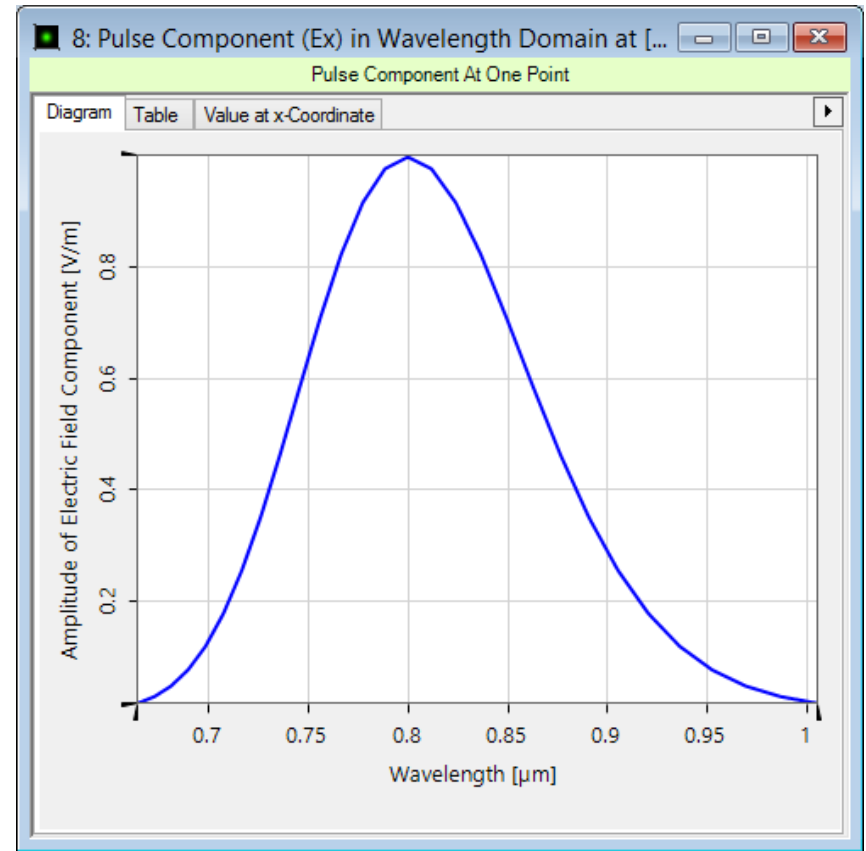


- On the optical path length evaluation tab page the user can set up additional output which is the basis for the time window extension algorithm.
- This output can be used for further optical path length analysis.

Pulse Evaluation – Result 1D

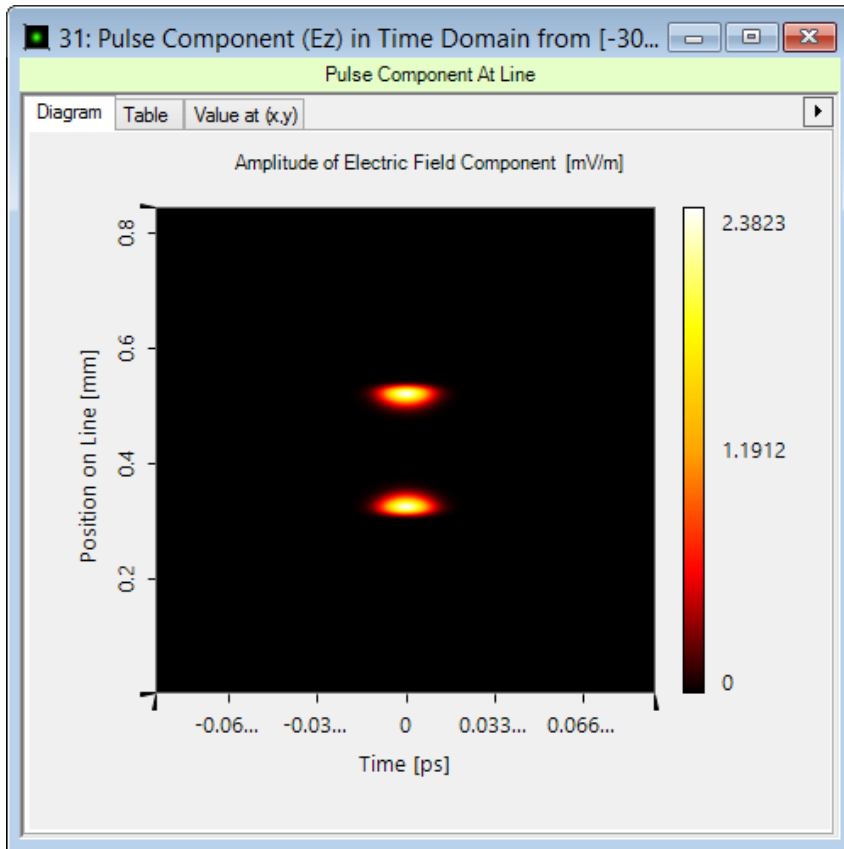


1D Pulse (Ex) Time Domain

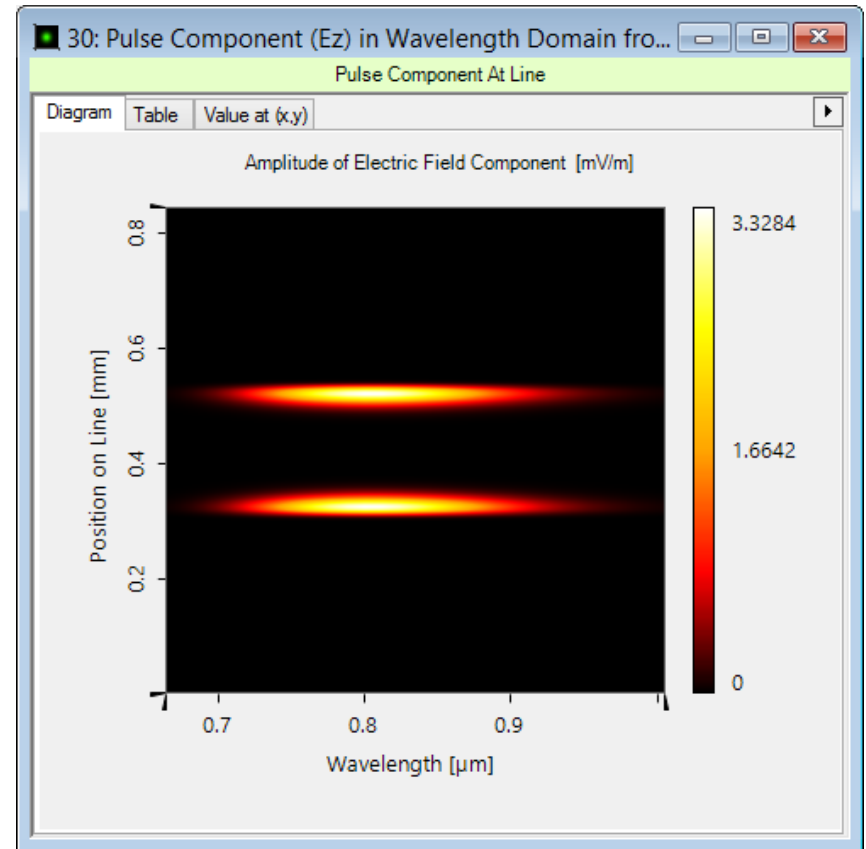


1D Pulse (Ex) Wavelength Domain

Pulse Evaluation – Result 2D

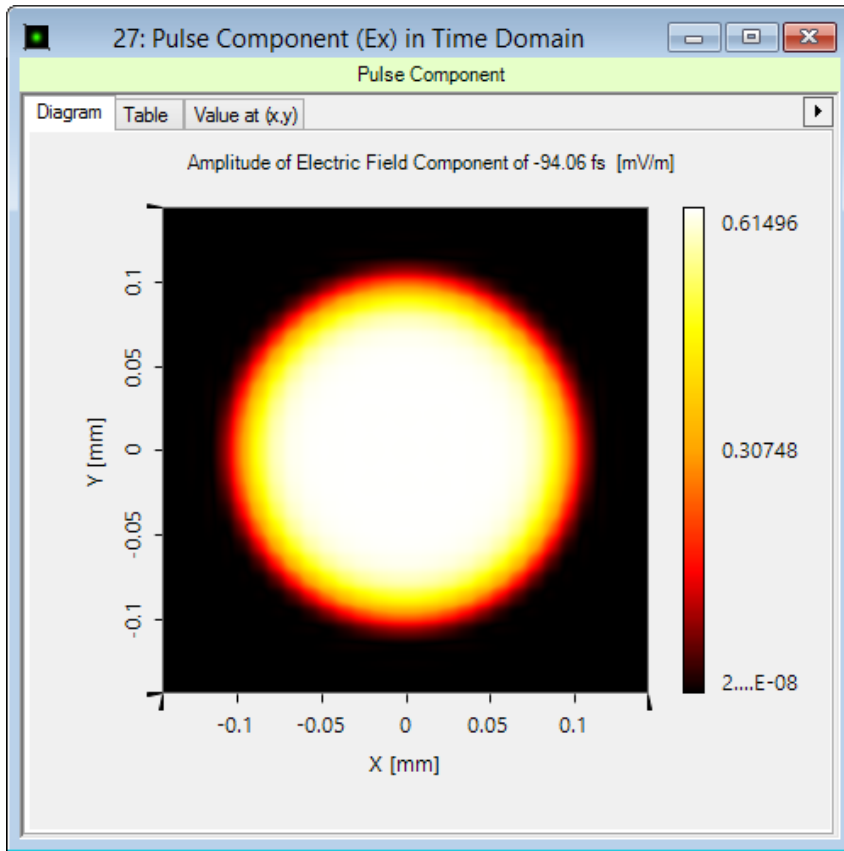


2D Pulse (Ez) Time Domain

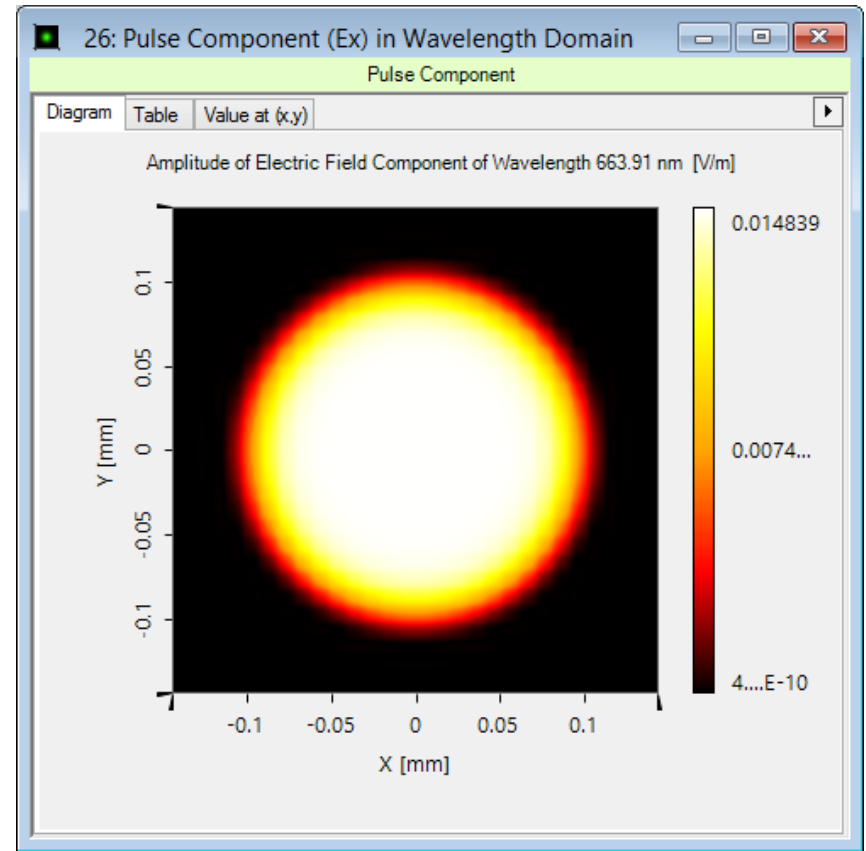


2D Pulse (Ez) Wavelength Domain

Pulse Evaluation – Result 3D



3D Pulse (Ex) Time Domain



3D Pulse (Ex) Wavelength Domain

Summary

- The pulse evaluation detector can be used to generate 1D, 2D or 3D pulse information.
- The detector allows the access to all vectorial components of the incident electromagnetic field (e.g. E_x , E_y and E_z).
- The 3D pulse information can be converted into an animation. Therefore first convert the 3D pulse information object to Numerical Data Array with “Extract Numerical Data” tool in the manipulation ribbon. Then transform the Numerical Data Array into an animation with the “Create Animation” ribbon in the manipulation tab of the Numerical Data Array.