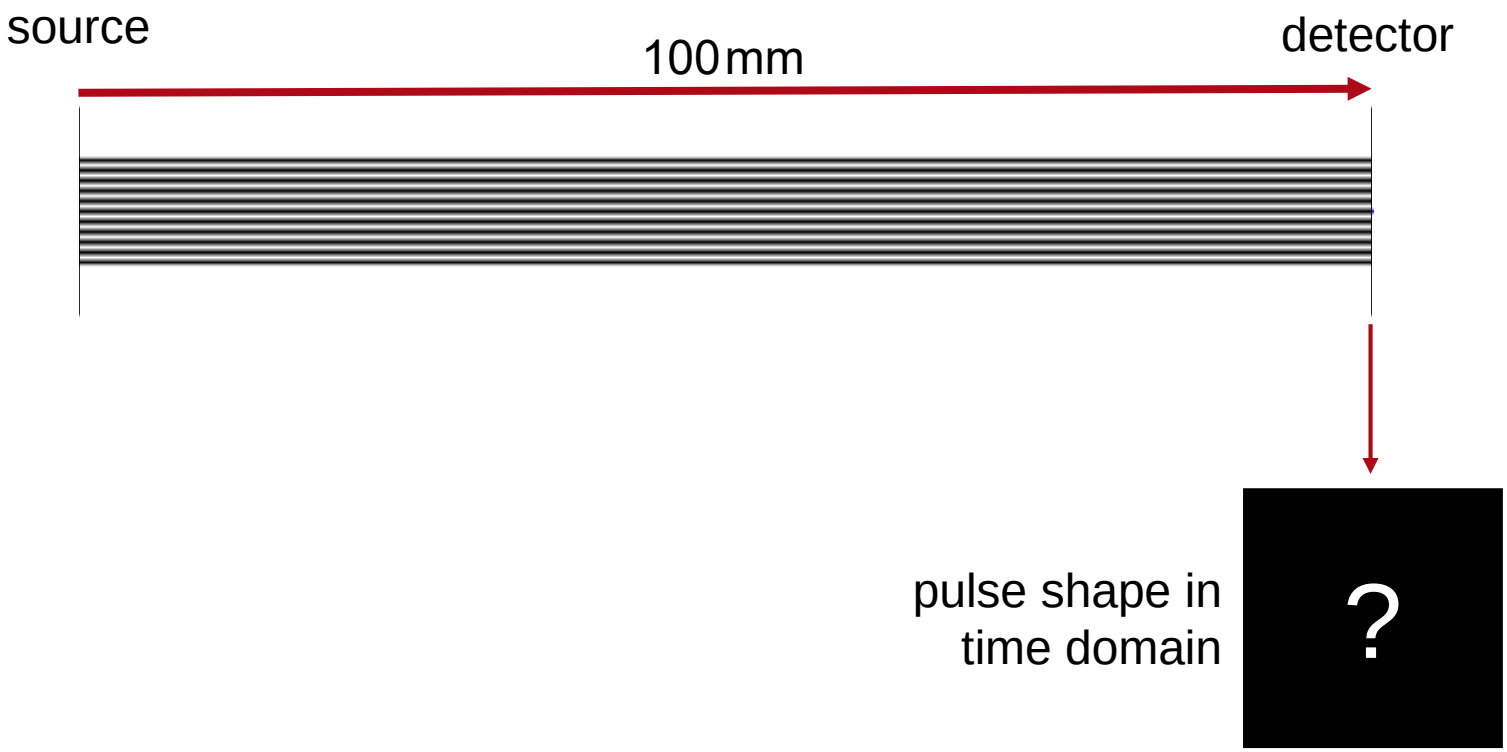
Laser Systems > Femtosecond Pulse Modeling

fs Pulse Propagation through Dispersive Seawater

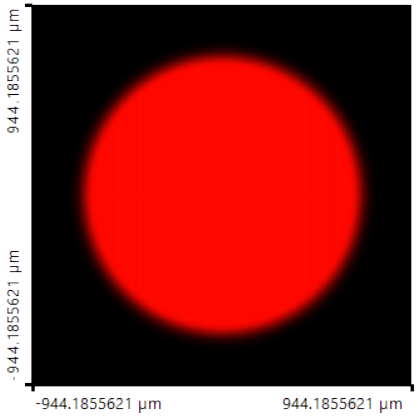
Task/System Illustration



Highlights

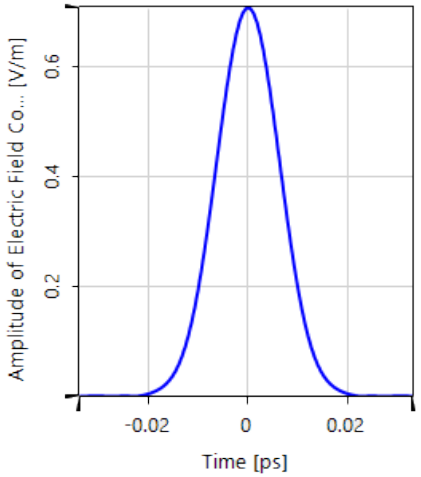
fast simulation of a fs pulse
through dispersive media
→ analysis of impact on pulse shape

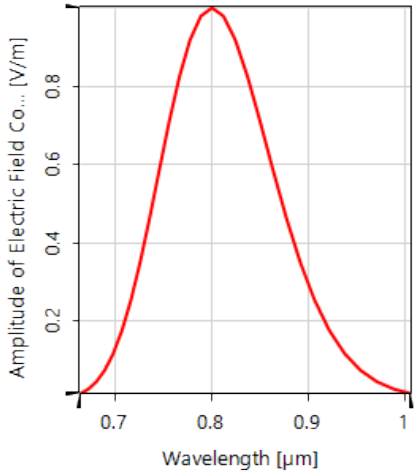
Specification: Light Source (for all Wavelengths)



Parameter	Description / Value & Unit
type (lateral)	plane wave
polarization	linear in x-direction (0°)
beam diameter	1.28 mm (circular)

Specification: Light Source (Spectrum)

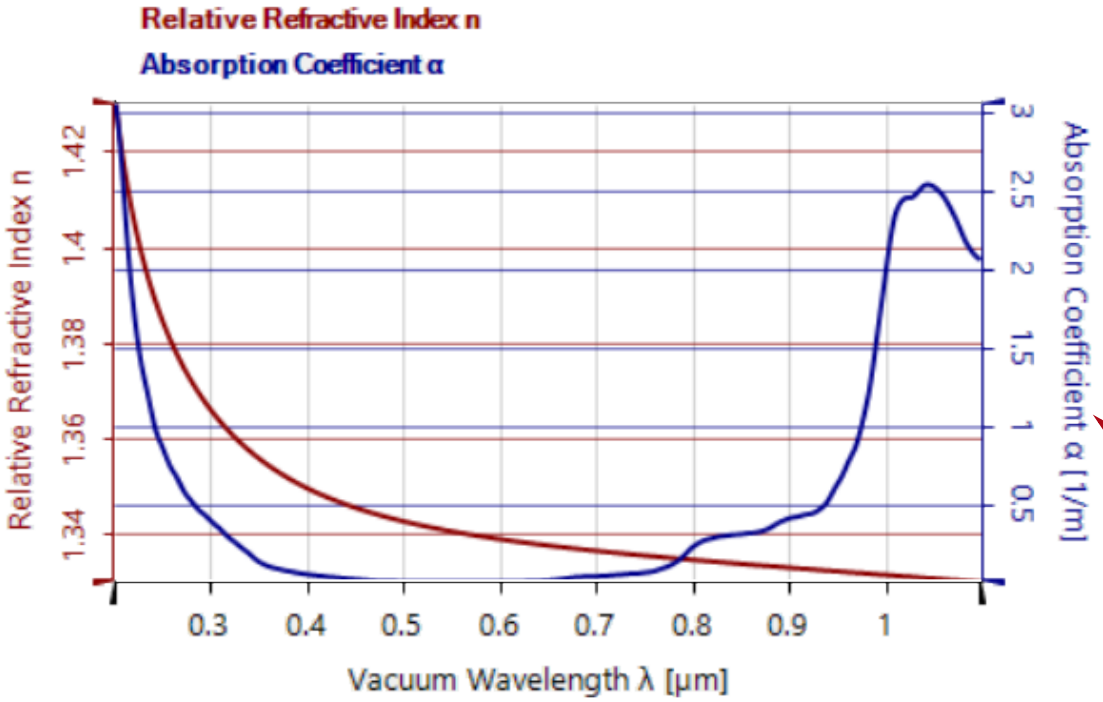




Parameter	Description
type (temporal)	Gaussian pulse spectrum
carrier wavelength	800 nm
FWHM	10 fs
medium/material	homogeneous seawater

Specification: Seawater Medium

here



specification of media with

- **refractive index**
- **absorption coefficient**

for simulation of dispersion

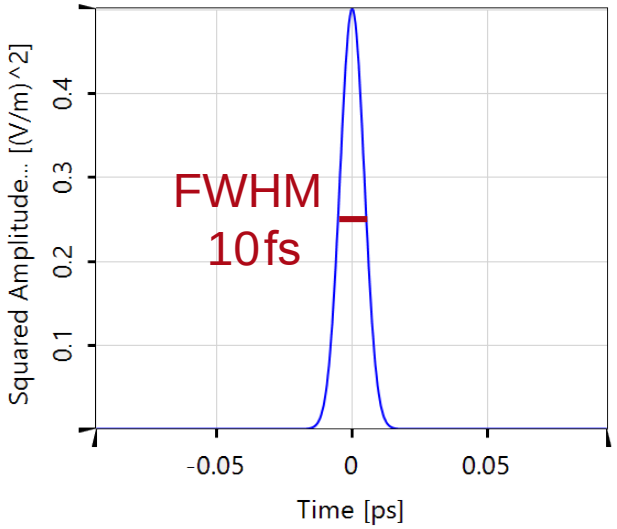
Specification: Detectors

Position	Modeling Technique	Detector
a, b	field tracing	pulse evaluation: 1D at point (0,0) & 2D

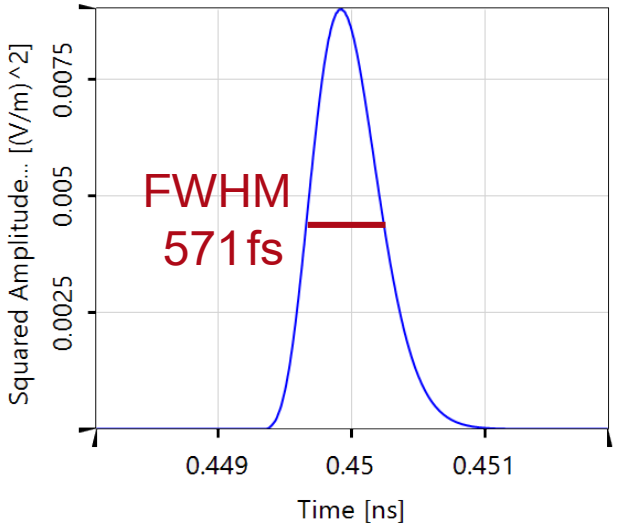
Results: 1D Field Tracing

Highlight

fast simulation of a fs pulse
through dispersive media
→ analysis of impact on pulse shape



simulation time ~3s



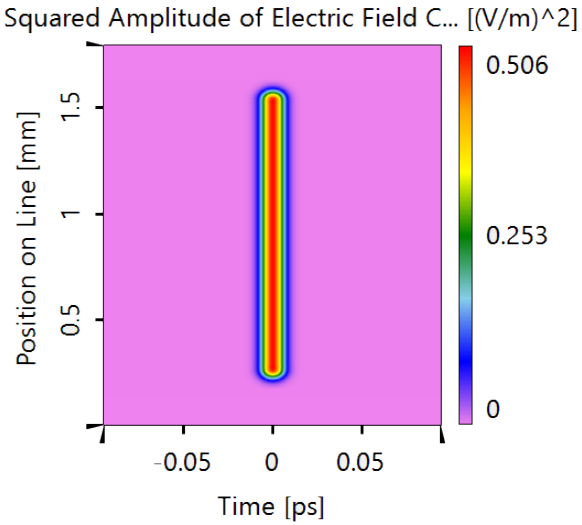
a pulse envelope 1D

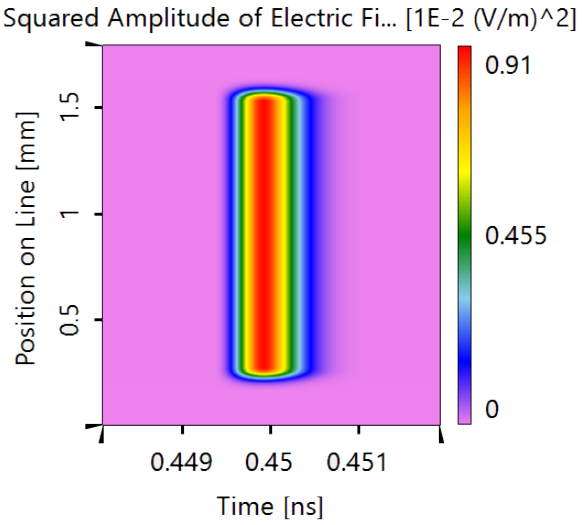
b pulse envelope 1D

Results: 2D Field Tracing

Highlight

fast simulation of a fs pulse
through dispersive media
→ analysis of impact on pulse shape





a pulse envelope 2D

b pulse envelope 2D

Document & Technical Info

code	FPM.0002
version of document	1.0
title	fs Pulse Propagation through Dispersive Seawater
category	Femtosecond Pulse Modeling (FPM)
author	Roberto Knoth (LightTrans)
used VL version	7.0.0.29

Specifications of PC Used for Simulation	
Processor	i7-4910MQ (4 CPU cores)
RAM	32 GB
Operating System	Windows 10