

lecture 3

NLSE with gain – simple amplifiers
and
pulse compression

$$g \text{ (1/m)} = -\ln(P_{\text{out}}/P_{\text{in}})/L = 4.343 * g \text{ (dB/m)}$$



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100 fs pulse, +/-10ps window, 1k, 1nJ

only dispersion and spm, MFD=10 μm, L=1 m, gain=20dB/m, profile: 1030 nm, 40 nm width, gaussian

Propagation parameters

standard propagation

waveguide

loss 1/m

gain 1/m

MFD μm

gamma 1/(W m)

Esat μJ

simulation

dispersion Raman

spm self-steepening

parameter

temporal gain saturation

steps

stepsize m

distance m

live measure

write file

adaptive

local error

Gain

gain profile

Center nm

Width ~ nm

shape

add second peak

Center nm

Width ~ nm

shape

ratio of second to first peak (set to zero for only one peak):

gain saturation J $g = g_0 / (1 + E / E_{sat, gain})$

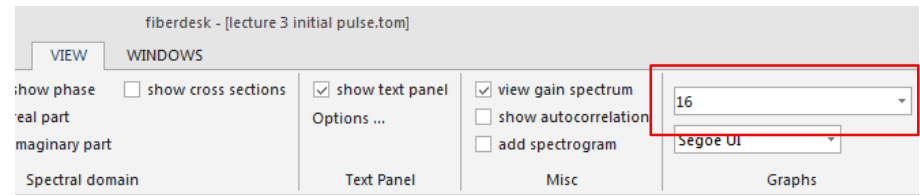
user defined gain file

use ASCII file for gain profile given in g(1/m) vs. wavelength (separator TAB)

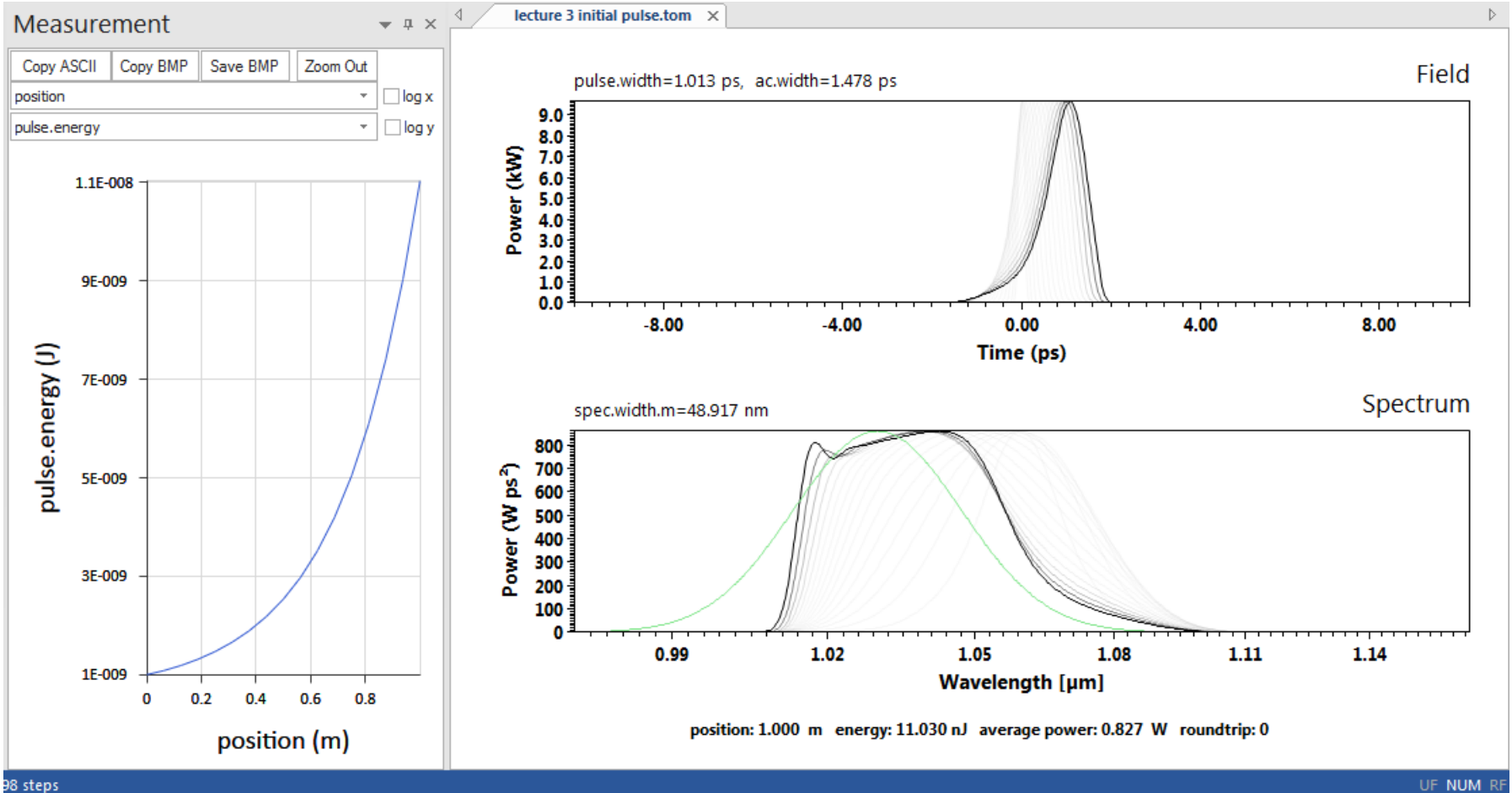
Time (ps)

Wavelength [μm]

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results – with „view“ > “persistence” set to 16 and 16 steps.



98 steps

UF NUM RF