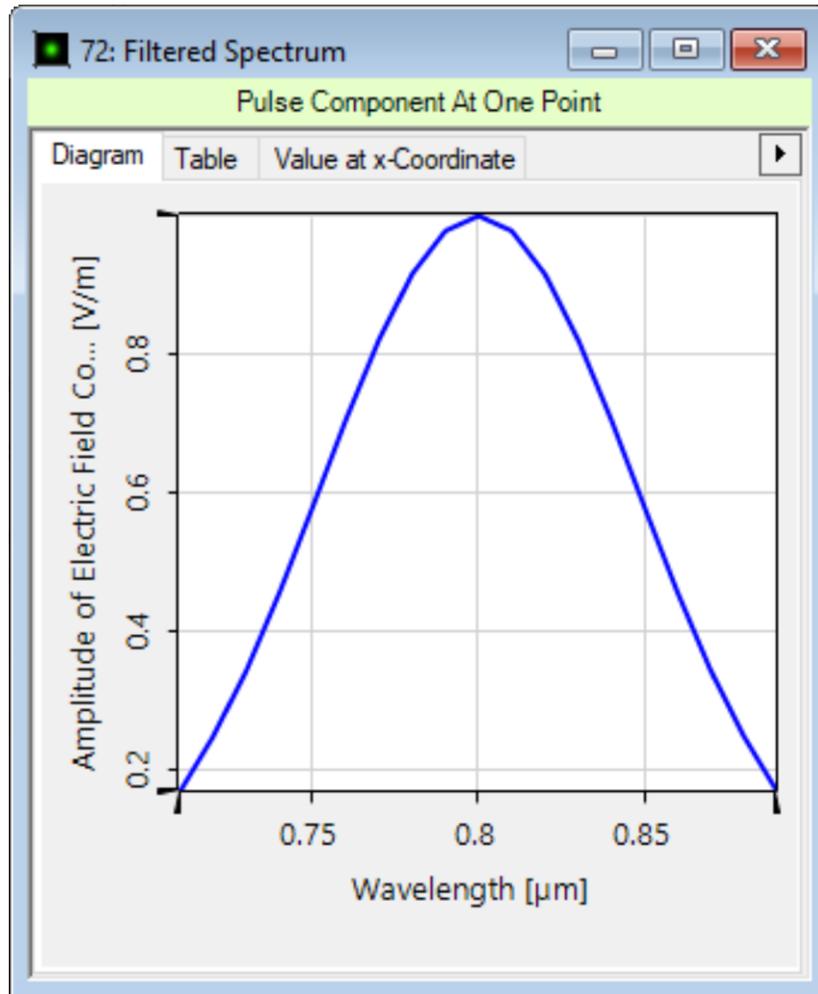


Programming a Spectral Band Filter

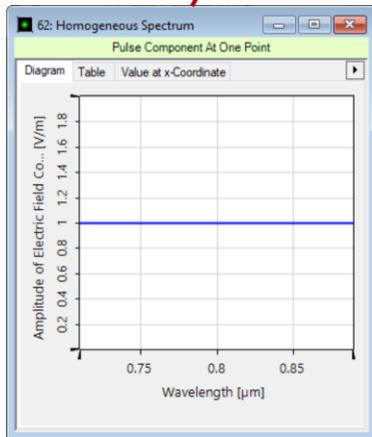
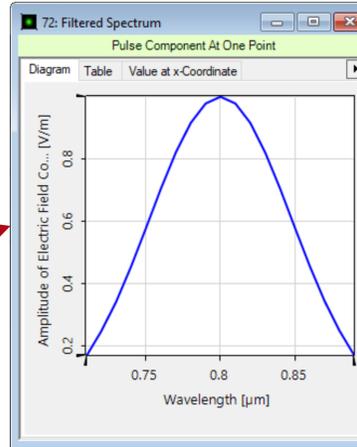
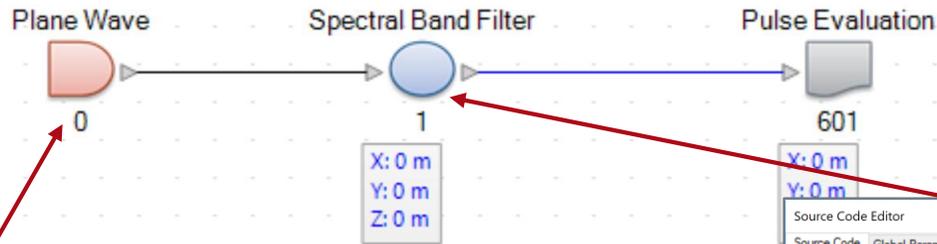
Abstract



This example shows how to define a customizable spectral band filter by using a programmable function in VirtualLab Fusion. The filter function is demonstrated on a homogenous input spectrum. The user can define the spectral filter profile with a 2D double array containing the wavelength-dependent transmittance values. One can modify the spectral filter in the source code editor or import the filter from ASCII files.

System Setup for a Spectral Band Filter

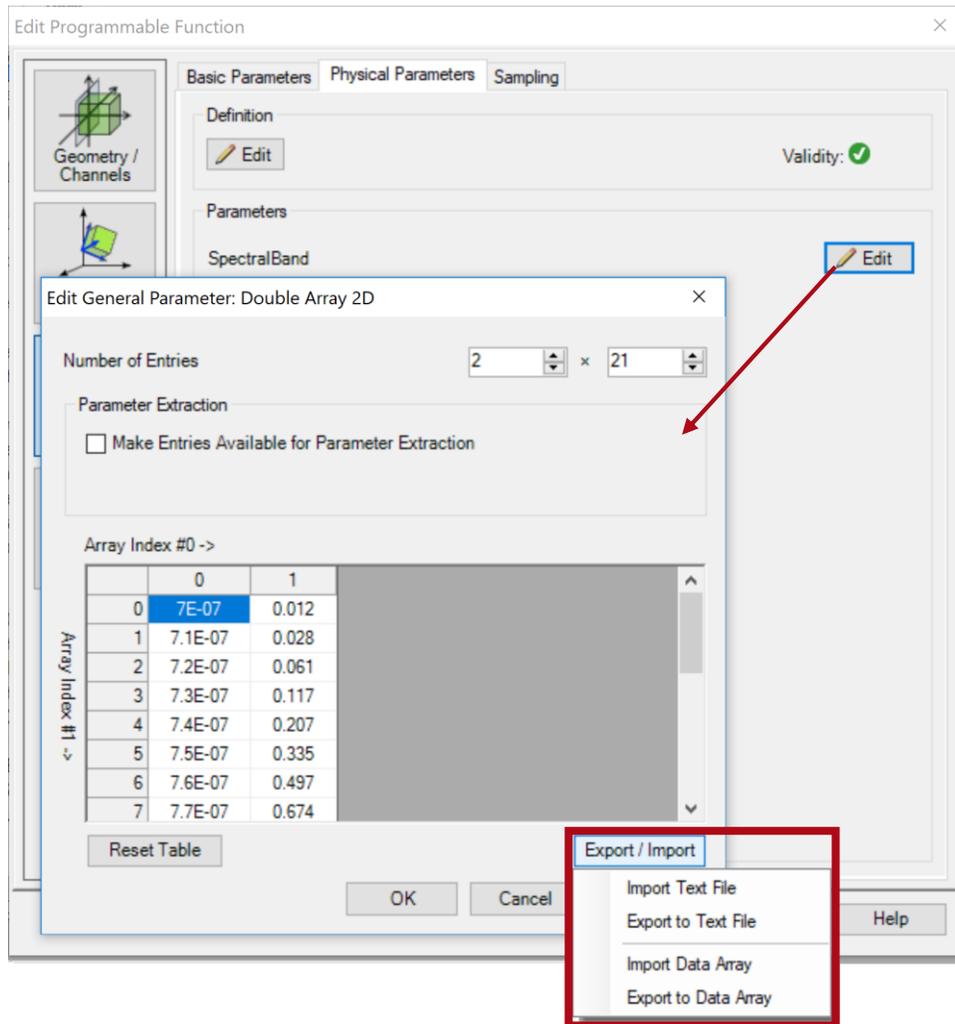
Task:
Create a customizable spectral band filter.



```
3  
4 int IDnextBiggerWL = -1;  
5 for(int runFindWL = 0; runFindWL < SpectralBand.GetLength(1); runFindWL++)  
6 if(SpectralBand[0, runFindWL] > Wavelength){  
7 IDnextBiggerWL = runFindWL;  
8 break;  
9 }  
10 }  
11  
12 //linear interpolation  
13 double linearInterpolatedScaleFactor = 0;  
14  
15 if(IDnextBiggerWL > 0){  
16 //if the id of the next wl is well initialized => perform linear interpolation  
17 double w11 = SpectralBand[0, IDnextBiggerWL-1];  
18 double w12 = SpectralBand[0, IDnextBiggerWL];  
19 double val1 = SpectralBand[1, IDnextBiggerWL-1];  
20 double val2 = SpectralBand[1, IDnextBiggerWL];  
21  
22 linearInterpolatedScaleFactor = val1 + (((Wavelength - w11)/(w12 - w11)) * (val2 - val1));  
23 }  
24 return Complex.Polar(Math.Sqrt(linearInterpolatedScaleFactor), 0);
```

Array Index #0 ->	0	1
0	7E-07	0.012
1	7.1E-07	0.028
2	7.2E-07	0.061
3	7.3E-07	0.117
4	7.4E-07	0.207
5	7.5E-07	0.335
6	7.6E-07	0.497
7	7.7E-07	0.674

Settings of the Spectral Band Filter



In the Settings the user can directly define a 2D-Array containing the wavelength-dependent transmittance values, or by loading another array or file by clicking on “Export/Import”.

Document Information

title	Programming a Spectral Band Filter
document code	CZT.0060
version	1.0
toolbox(es)	Starter Toolbox
VL version used for simulations	7.4.0.49
category	Feature Use Case
further reading	<ul style="list-style-type: none">- How to Work with the Programmable Function in VirtualLab Fusion + Example: Cylindrical Lens- Programming an Axicon Transmission Function