Reto F3001C

Max Eduardo Garcia Esquivel - A01236070.

Convinaciones con condicion:

Wg 1 - Modo 14, Modo 15

Wg 3 - Modo 15

Waveguide selector:

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Selected waveguide:
   Size: 1000x325
   Mode: 15
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Phase Matching

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Pump wavelength: 0.51-0.532
Photon wavelength: 1.53-1.596
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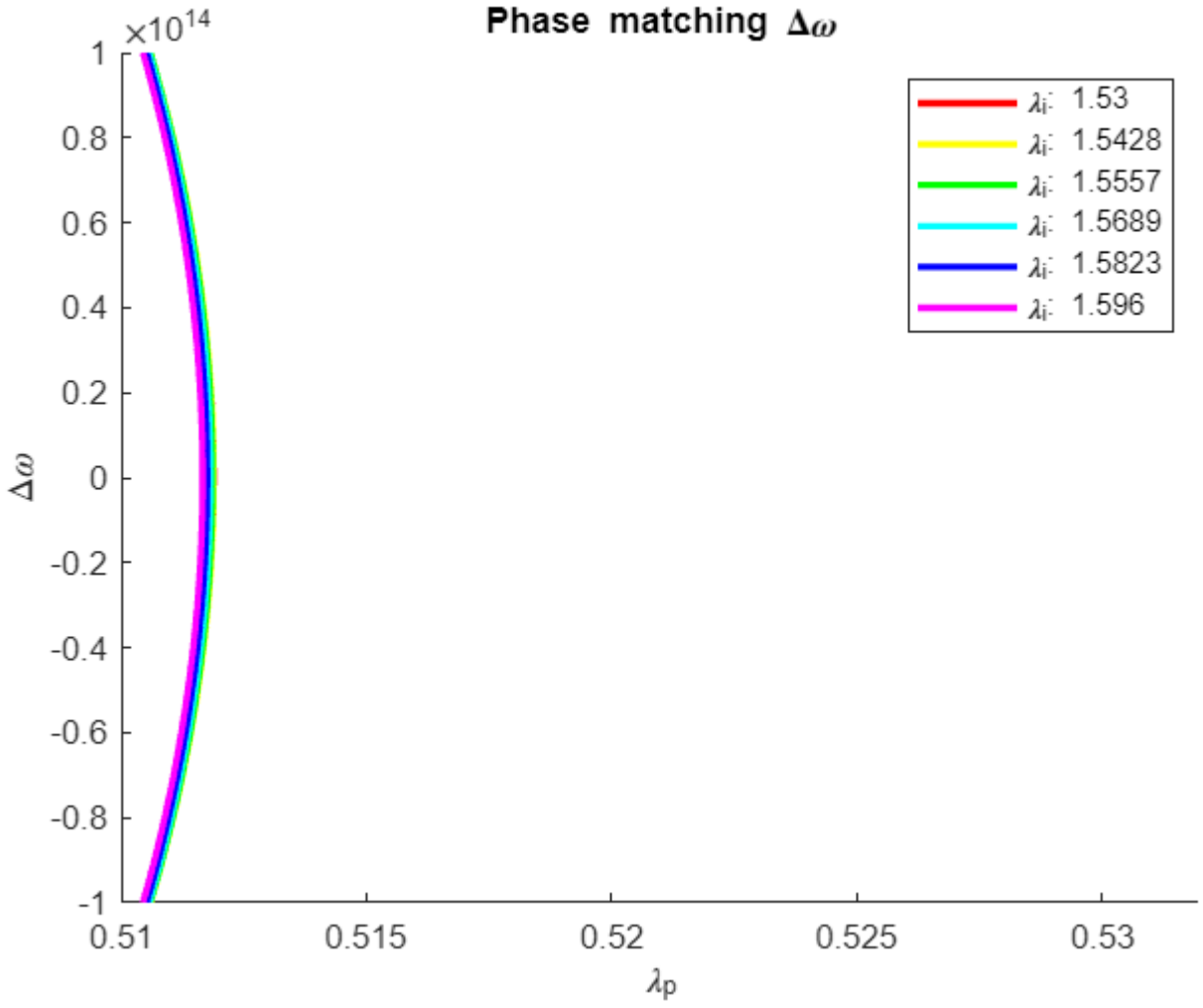
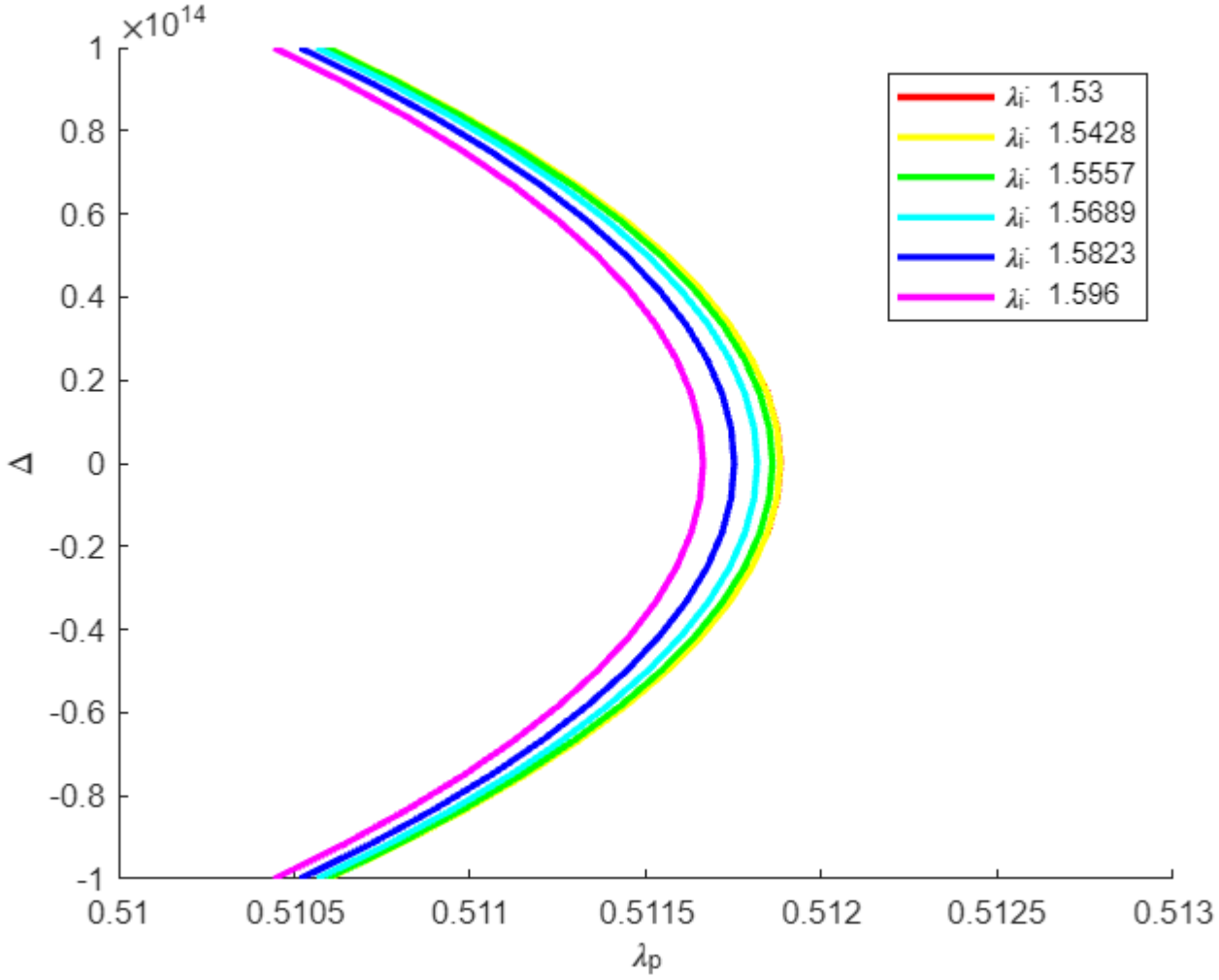


Phase Matching (Zoomed)



Comprobation of Δk=0 at degenerancy

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Mode with dK=0
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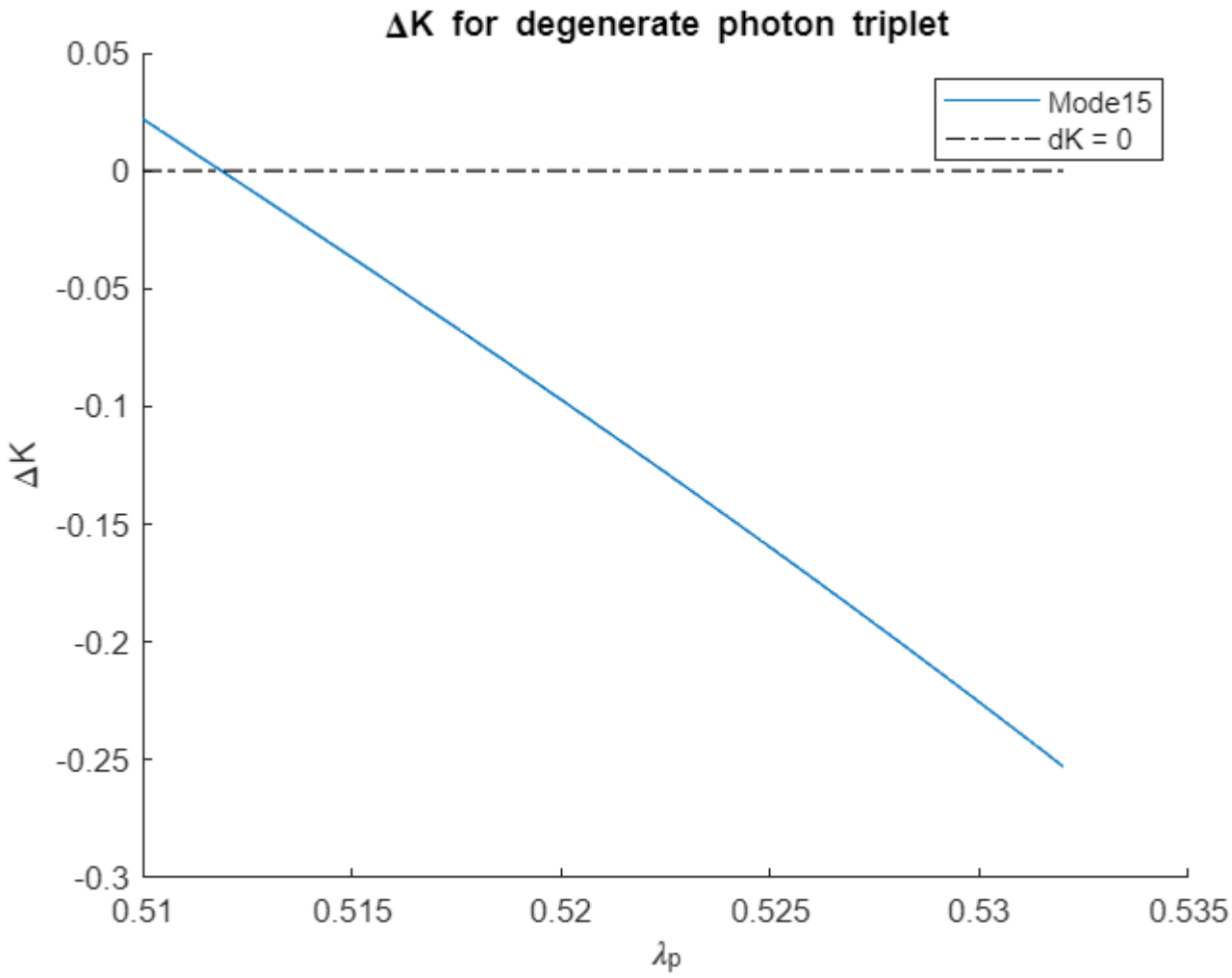

Obtain wavelengths for energy and momentum conservation

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Value with dk=0, Pump: w=3682380988.2178, l=0.51189, dk=1.8033e-06
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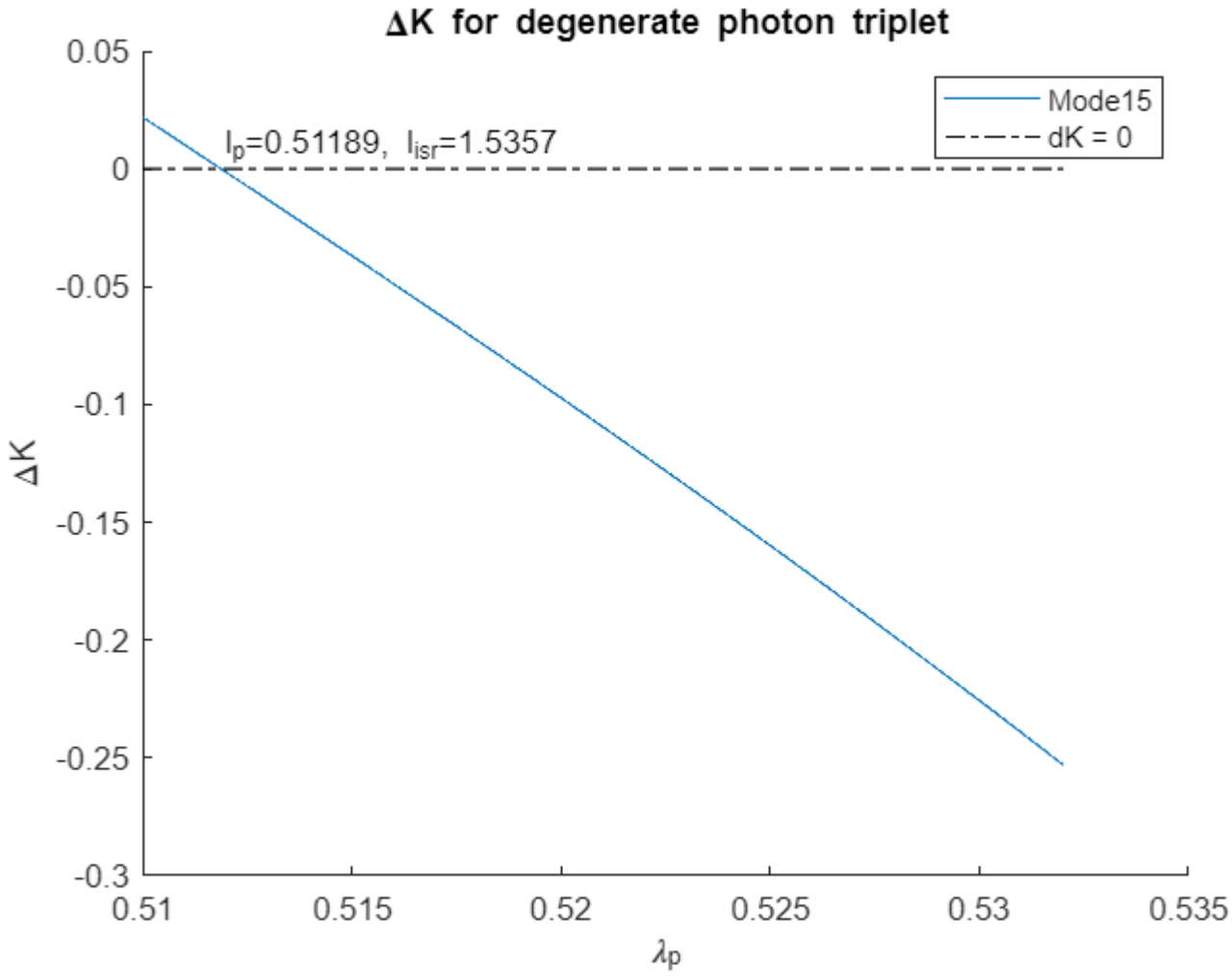


Data for photons

Wg1, M14: lp = 0.52119, lisr=1.56357. (σ=2e12, L=300μm)

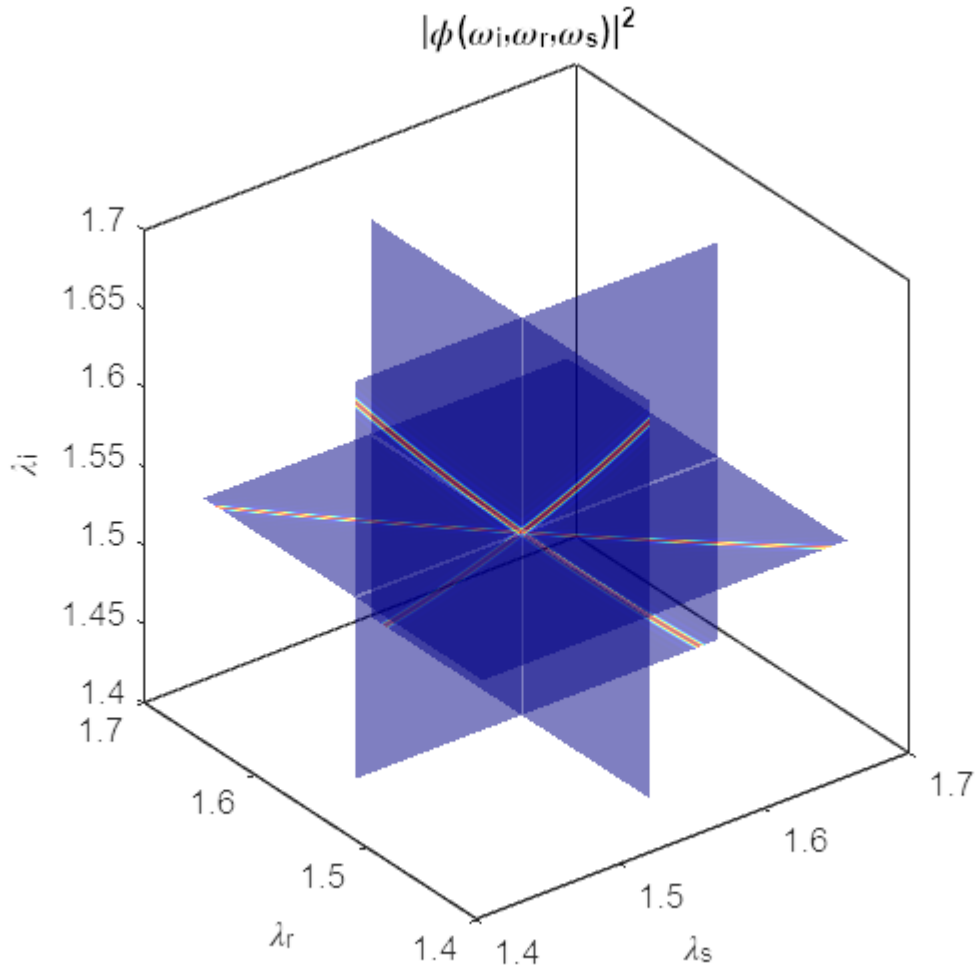
Wg1, M15: lp = 0.51189, lisr=1.53567.

Wg3, M15: lp = 0.51971, lisr=1.55913.

Phase Matching Function

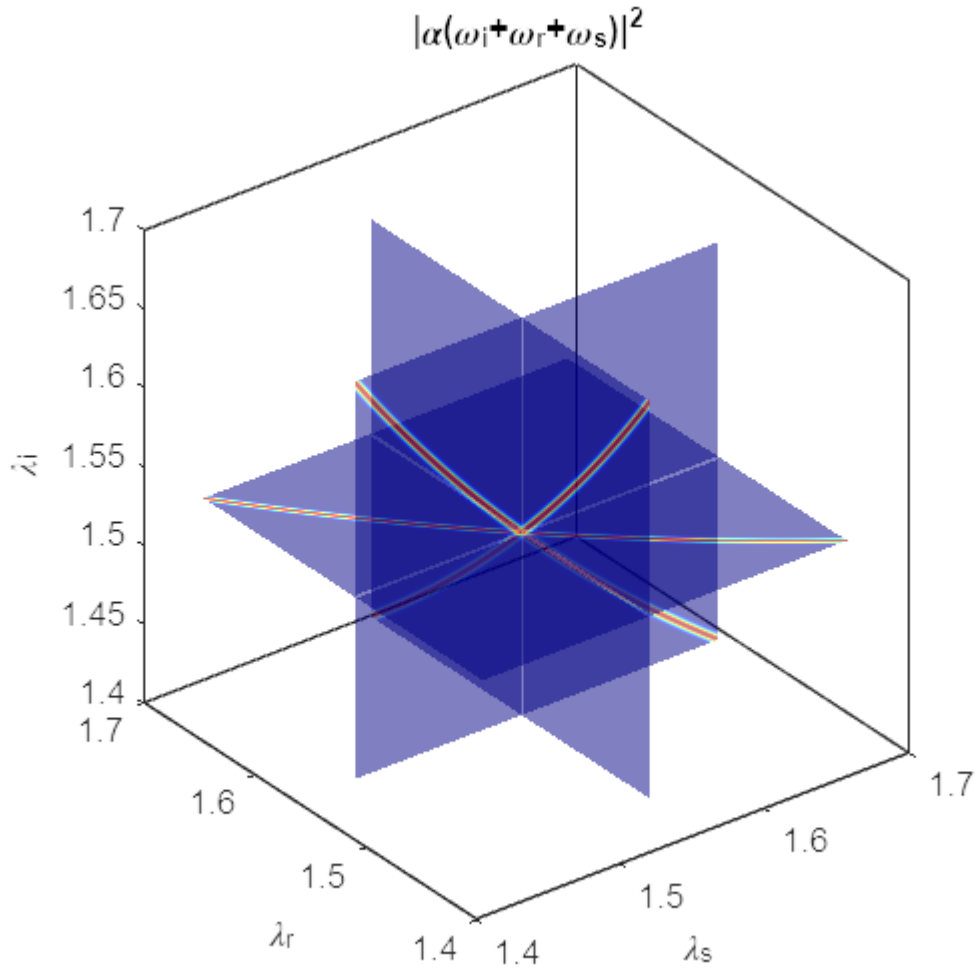
$$\phi(\omega_r, \omega_s, \omega_i) = \mathrm{sinc}\left[L\frac{\Delta k(\omega_r, \omega_s, \omega_i)}{2}\right]\exp\left[\mathrm{iL}\frac{\Delta k(\omega_r, \omega_s, \omega_i)}{2}\right]$$

$$\Delta k(\omega_r, \omega_s, \omega_i) = k_p(\omega_r + \omega_s + \omega_i) - k_r(\omega_r) - k_s(\omega_s) - k_i(\omega_i) - \Phi_{\mathrm{NL}}$$



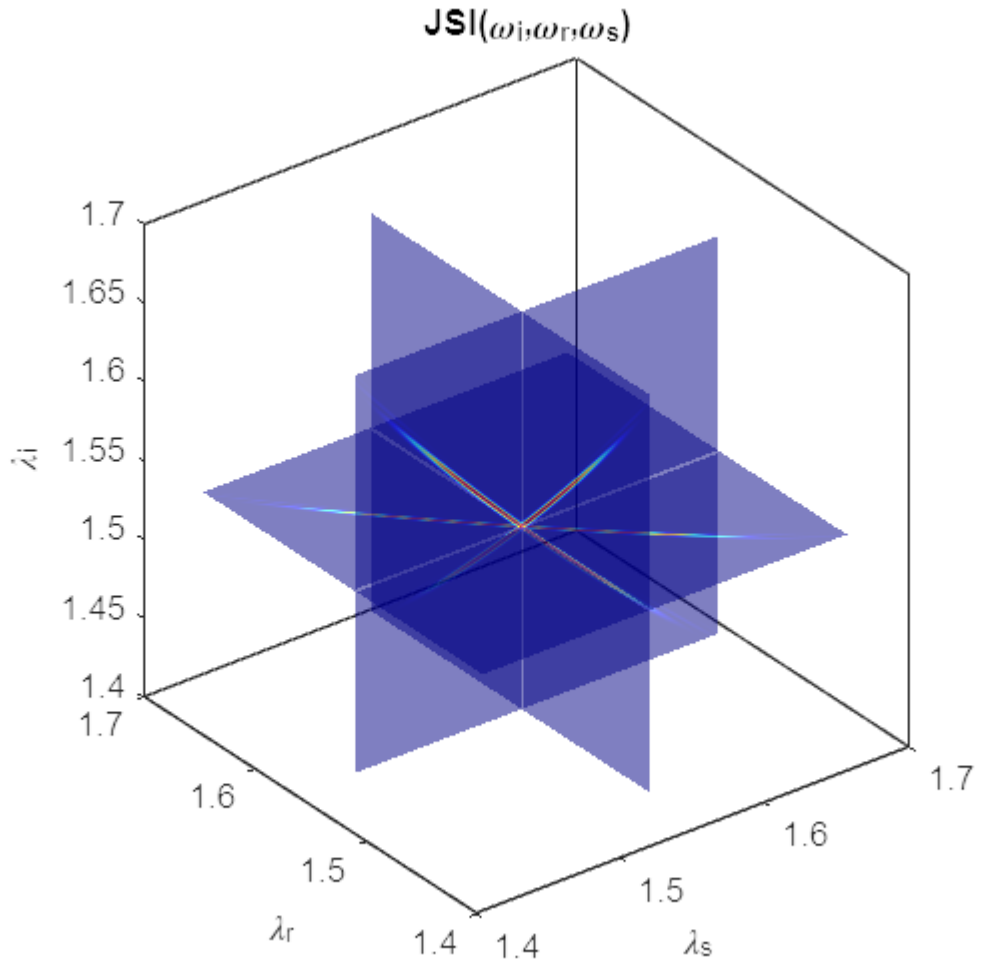
Pump Spectral Amplitude Function

$$\alpha(\omega_p) = \frac{2^{\frac{1}{4}}}{\pi^{\frac{1}{4}}\sqrt{\sigma}} e^{-\frac{(\omega_p-\omega_{p0})^2}{\sigma^2}}$$



Joint Spectral Intensity (JSI)

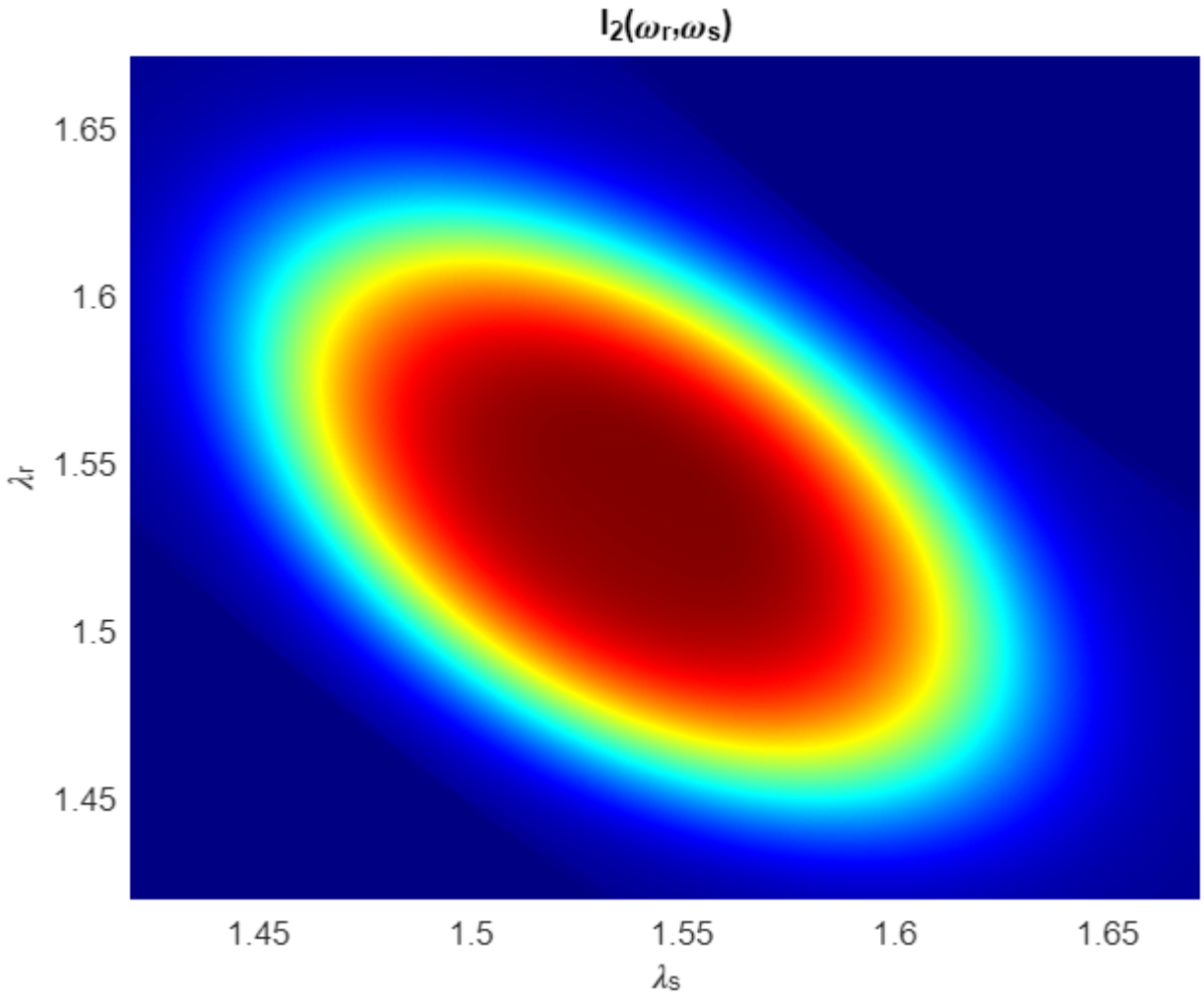
$F(\omega_r, \omega_s, \omega_i) = \alpha(\omega_r + \omega_s + \omega_i)\phi(\omega_r, \omega_s, \omega_i)$

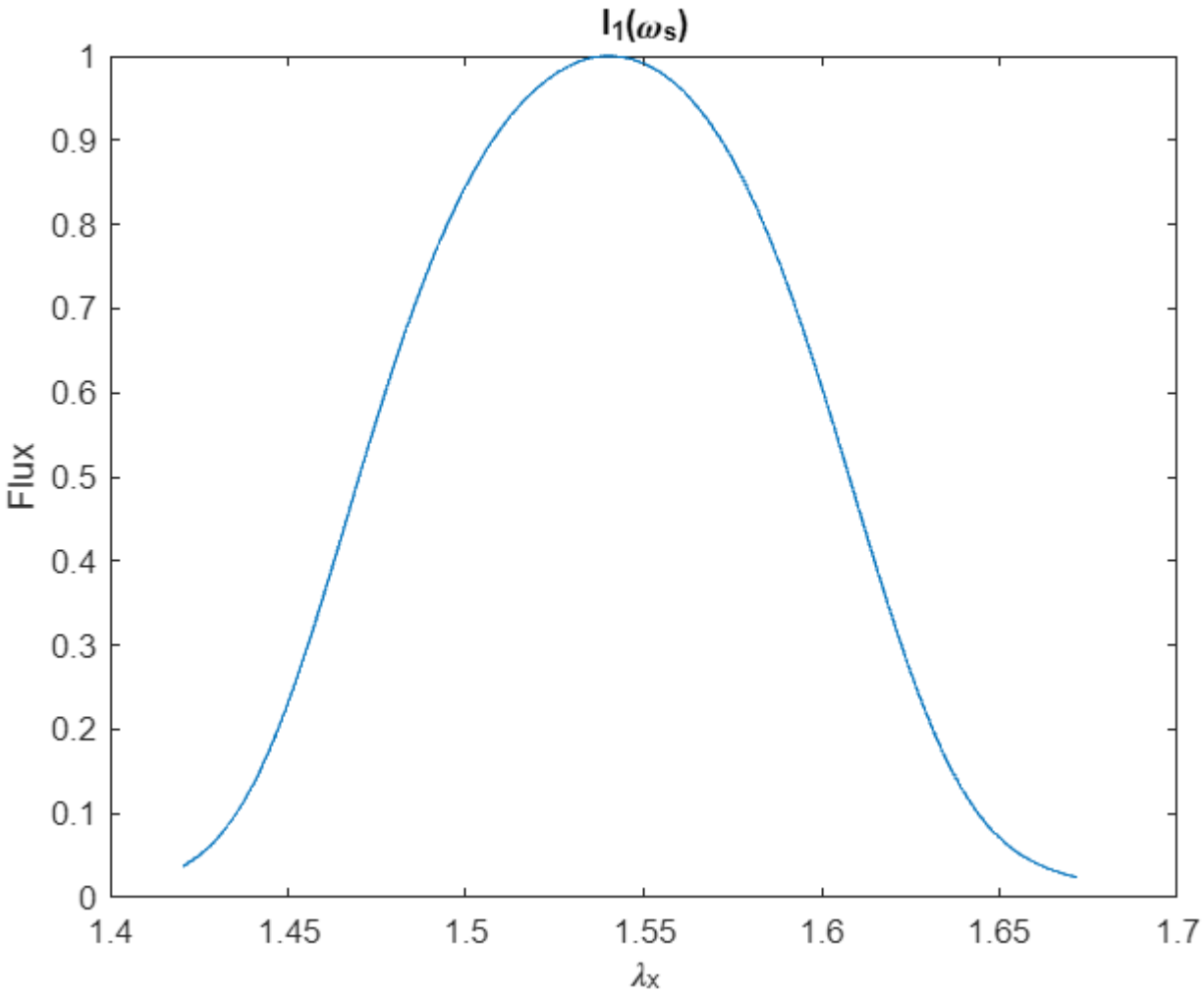


Intensities Proyected

$$I_2(\omega_r, \omega_s) = \int d\omega_i \, |F(\omega_r, \omega_s, \omega_i)|^2$$

$$I_1(\omega_r) = \int d\omega_s \int d\omega_i \, |F(\omega_r, \omega_s, \omega_i)|^2$$


$I_2(\omega_r,\omega_s)$
1.65
1.6
1.55
1.5
1.45
λ_r
1.45
1.5
1.55
1.6
1.65
λ_s


$I_1(\omega_s)$
Flux
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
1.4
1.45
1.5
1.55
1.6
1.65
1.7
λ_x