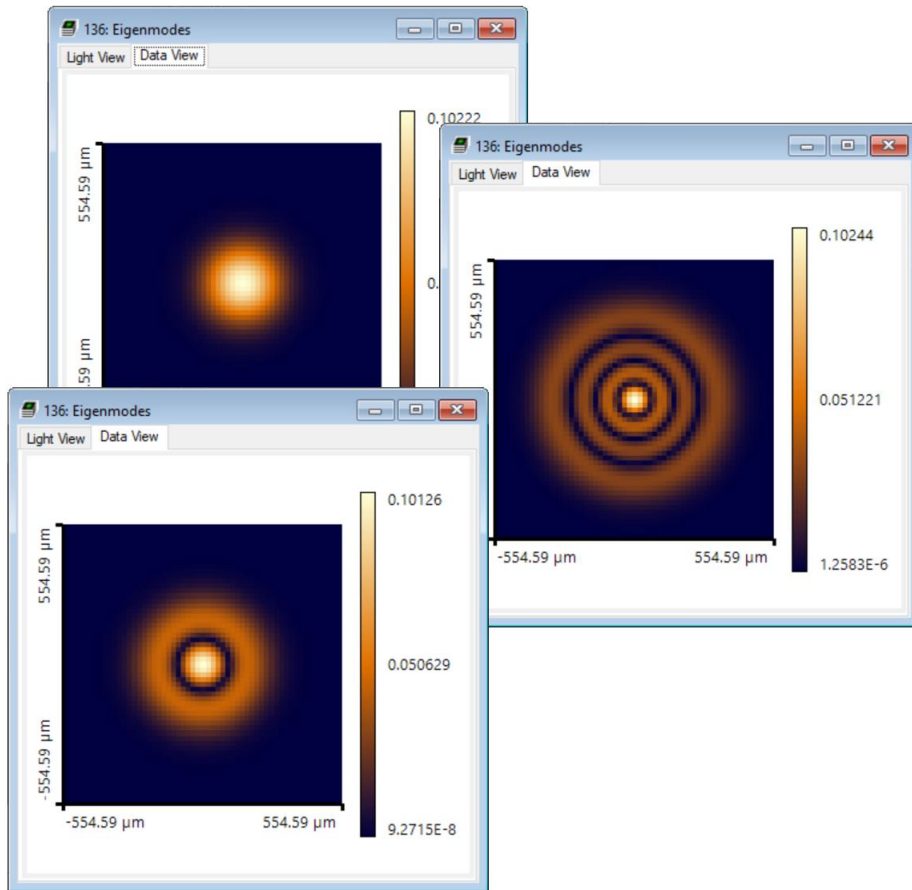


# Higher Modes in Laser Resonators

# Abstract



In many applications of laser resonators only one dominant mode is outcoupled. In certain resonator geometries however, multiple modes can overlay each other and therefore impact the quality of the outcoupled beam. In order to characterize this behavior the different laser resonator modes need to be calculated together with their corresponding Eigenvalue. In this demonstration we would like to show this procedure in a simplified resonator model.

# Task Description

resonator parameters

confocal mirror:

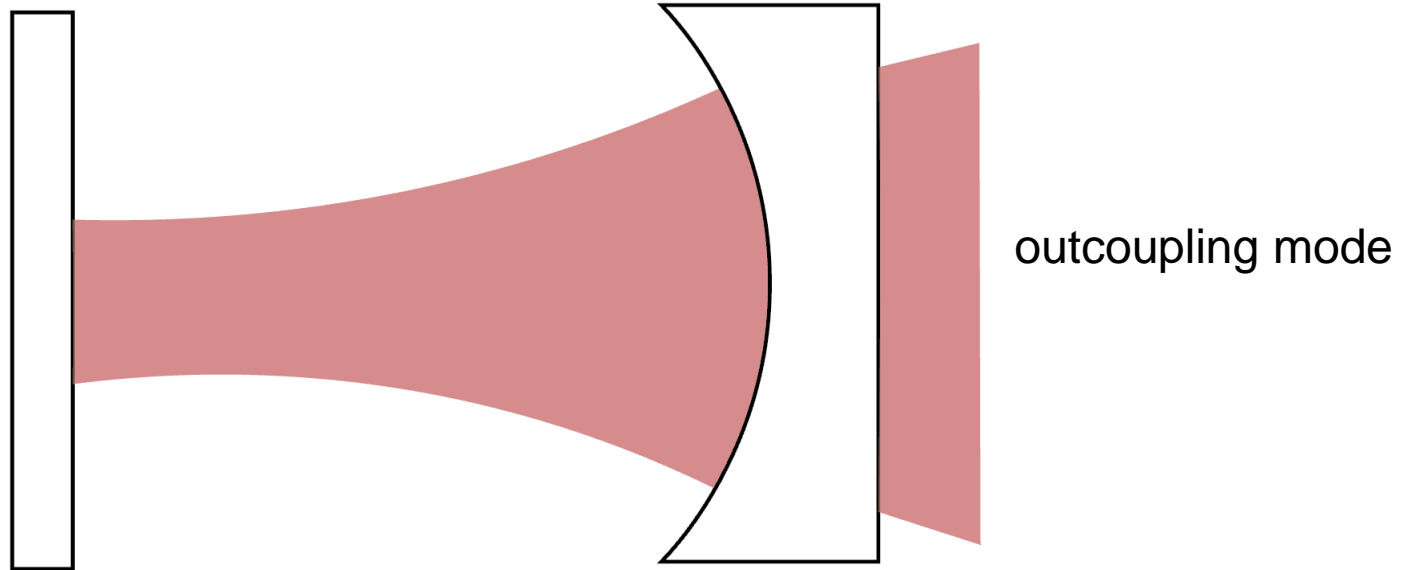
- radius = -250 mm

wavelength = 532 nm

length:

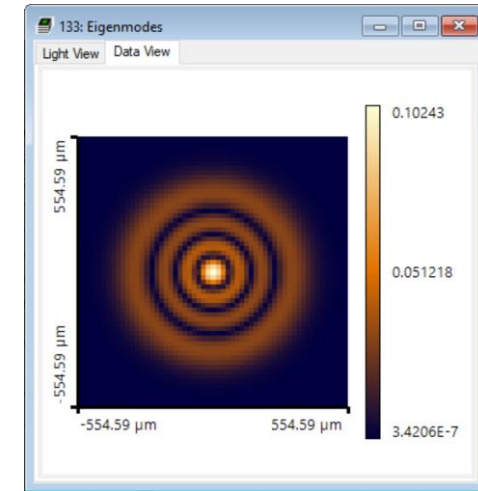
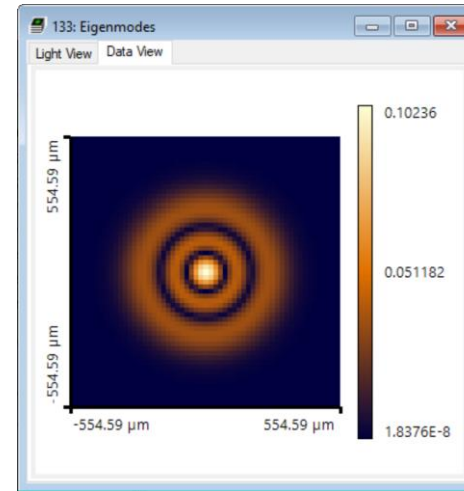
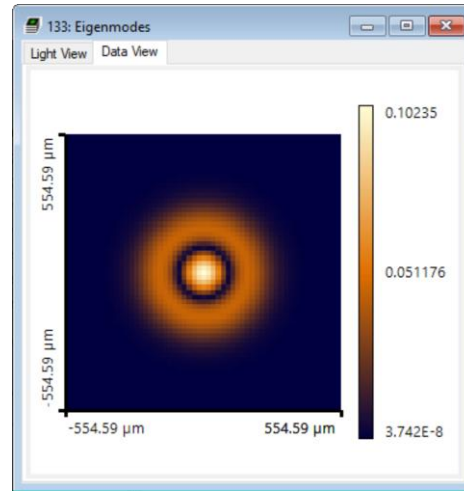
a) 100 mm

b) 110 mm

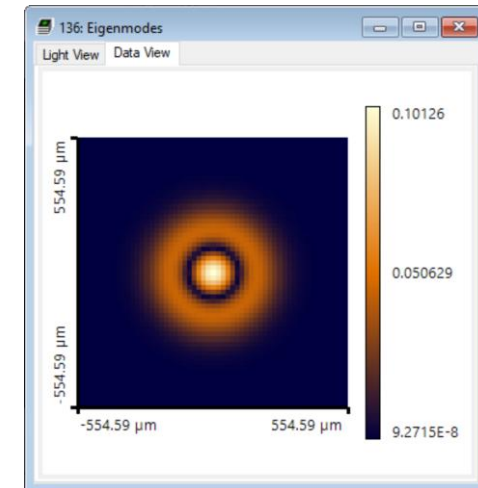
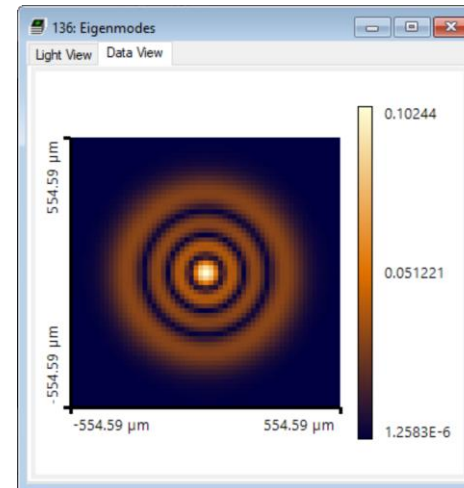
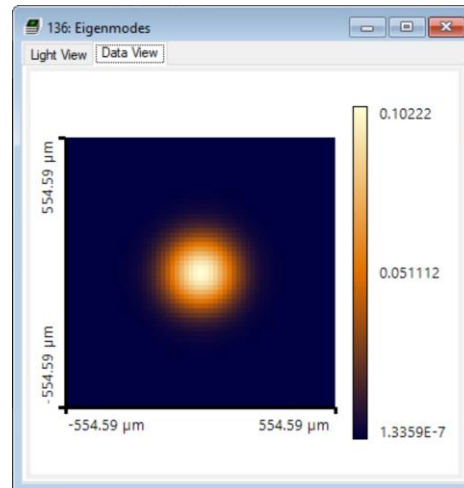


# Field Tracing Results

modes with the highest Eigenvalues for 100 mm length

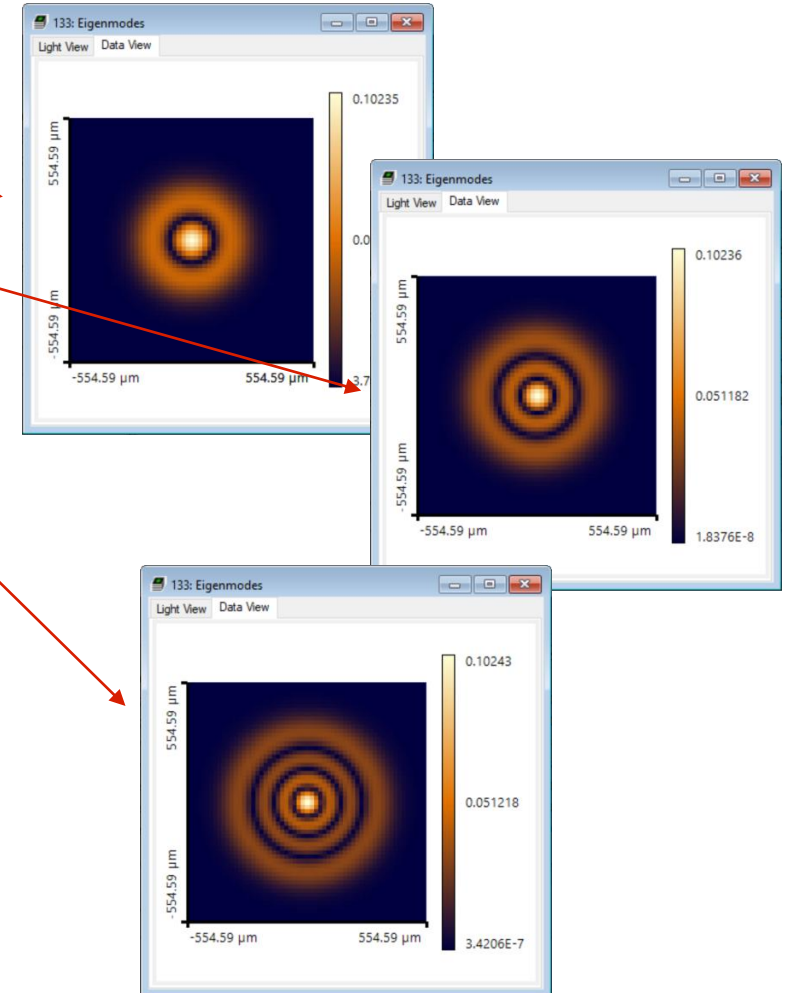


modes with the highest Eigenvalues for 110 mm length



# Mode Characteristics

Detector	Sub - Detector	Result
Losses	1	9.9135 %
	2	10.719 %
	3	10.906 %
	4	11.255 %
	5	13.574 %
	6	14.13 %
	7	22.924 %
	8	40.2 %
Eigenvalues	1	0.94914
	2	0.94488
	3	0.9439
	4	0.94205
	5	0.92965
	6	0.92666
	7	0.87793
	8	0.7733



Round Trip Losses and Eigenvalues can be calculated for each mode

# Document Information

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category	Demo
further reading	

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