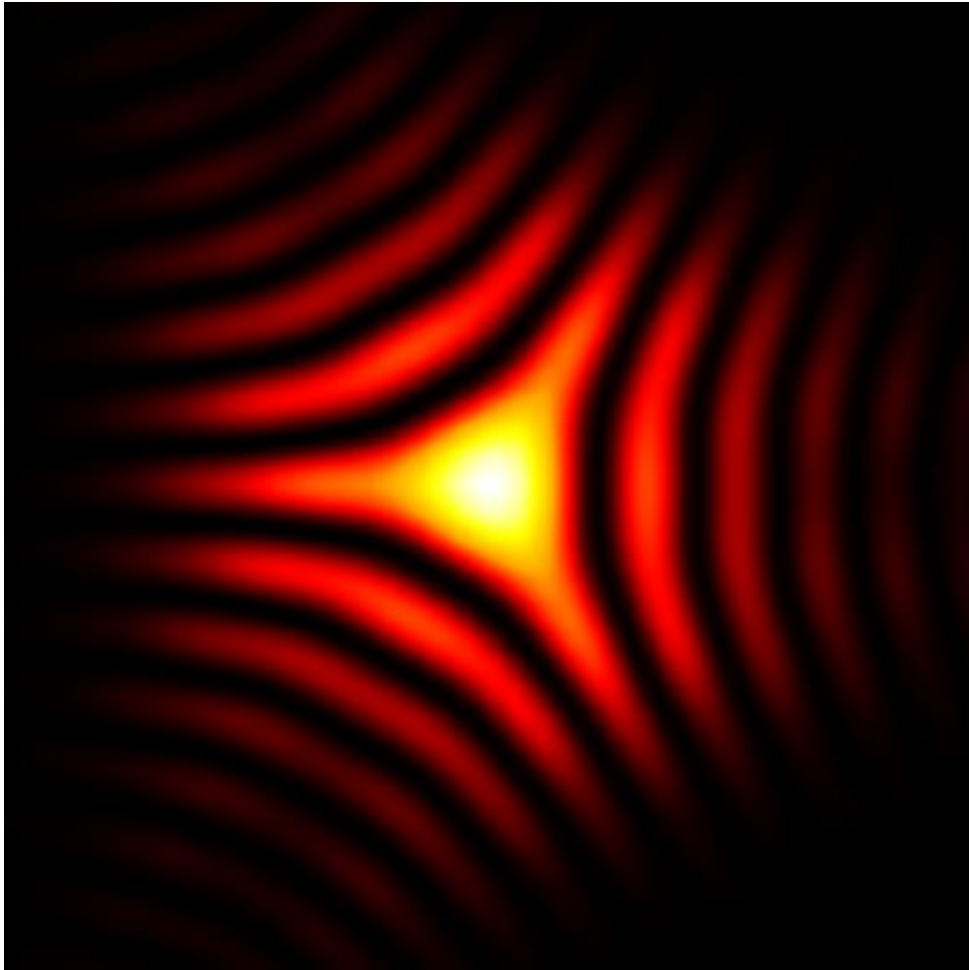


Influence of Aberration Effects of a Spherical Wave on the Focal Spot

Abstract

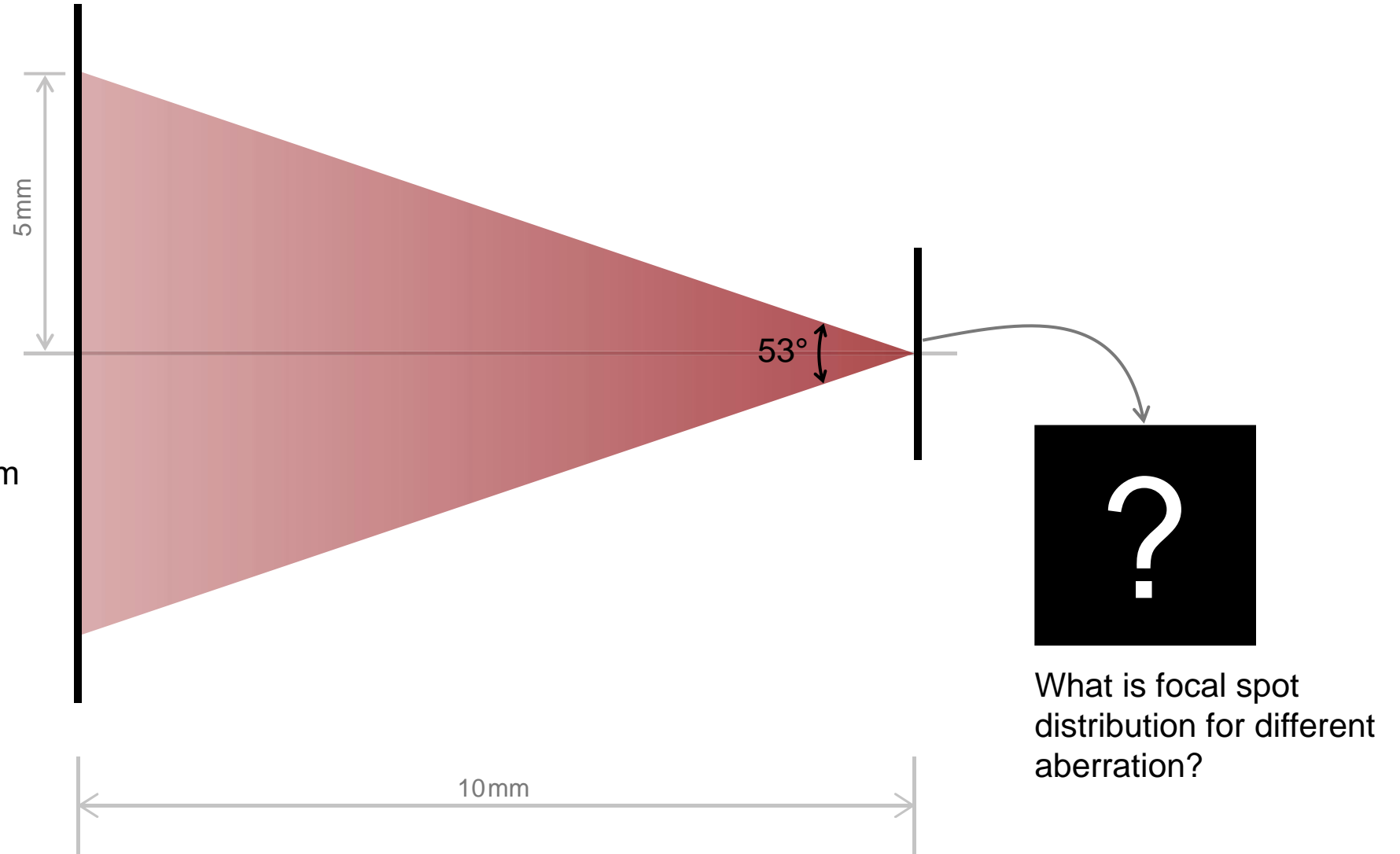


Different types of wavefront aberrations have individual influences on the pattern in focus. It is therefore crucial to be able to investigate these effects in detail, e.g. to evaluate the performance of imaging systems. In VirtualLab Fusion, different wavefront aberrations can be generated, and their effects on the focal spot distribution studied, conveniently. As examples, we select several typical aberrations (spherical, coma, astigmatism, ...), vary their values, and calculate the corresponding focal spot distributions.

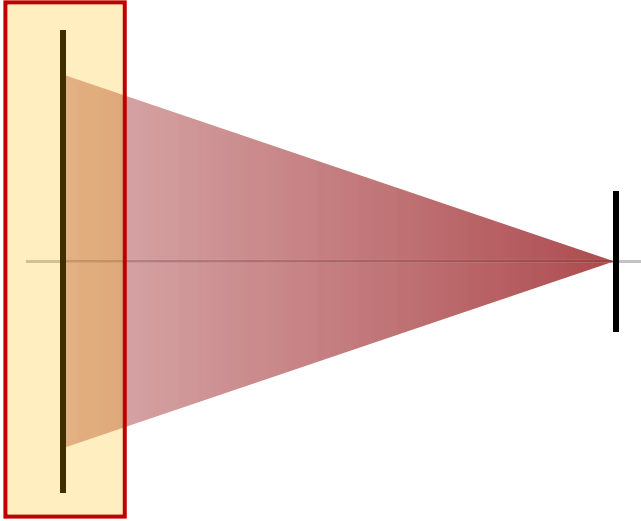
Modeling Task

spherical wave with different aberrations

- wavelength @ 532nm
- type of aberration:
 1. defocus
 2. spherical
 3. astigmatism
 4. coma
 5. secondary coma
 6. trefoil

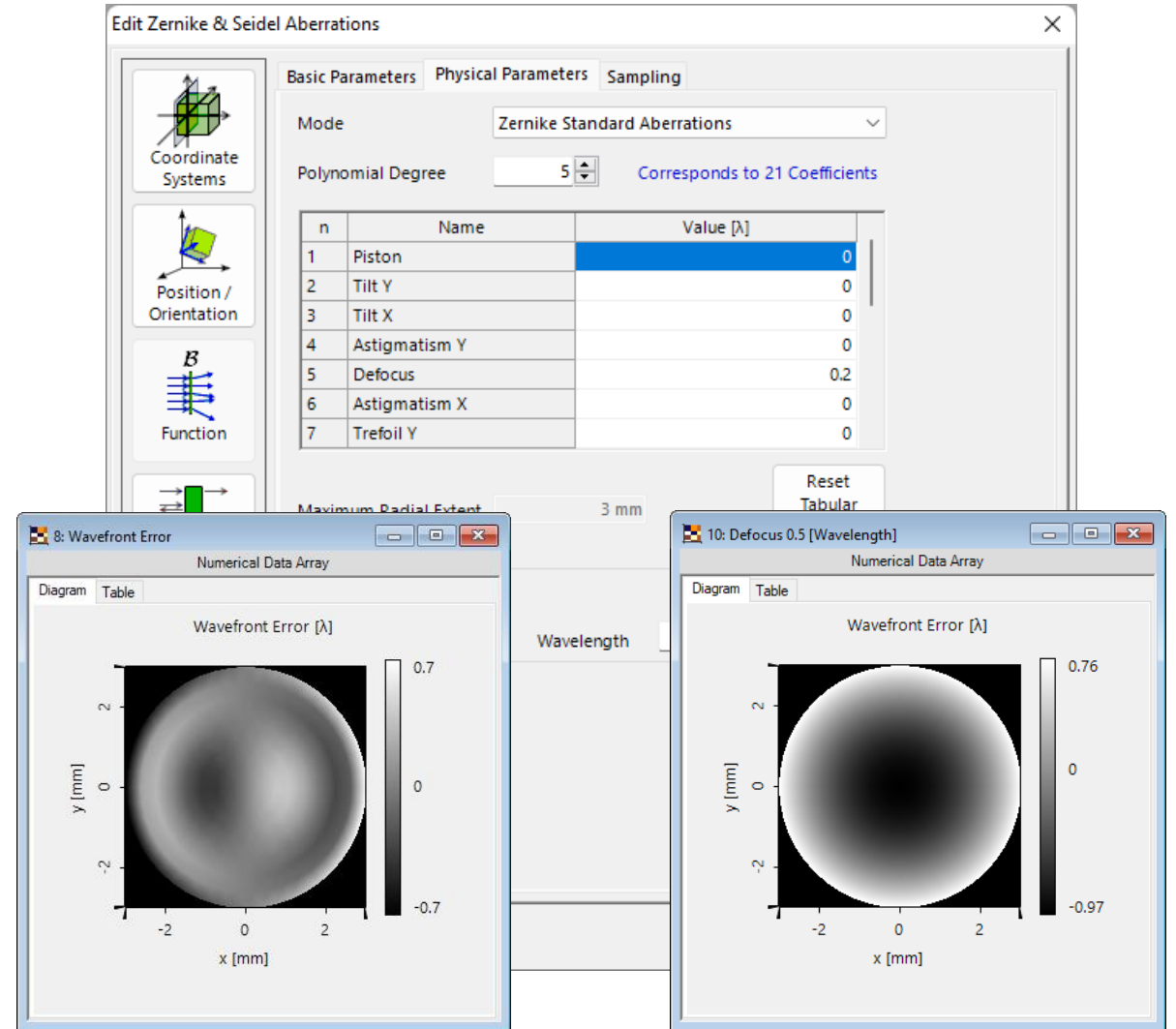


Zernike & Seidel Aberrations

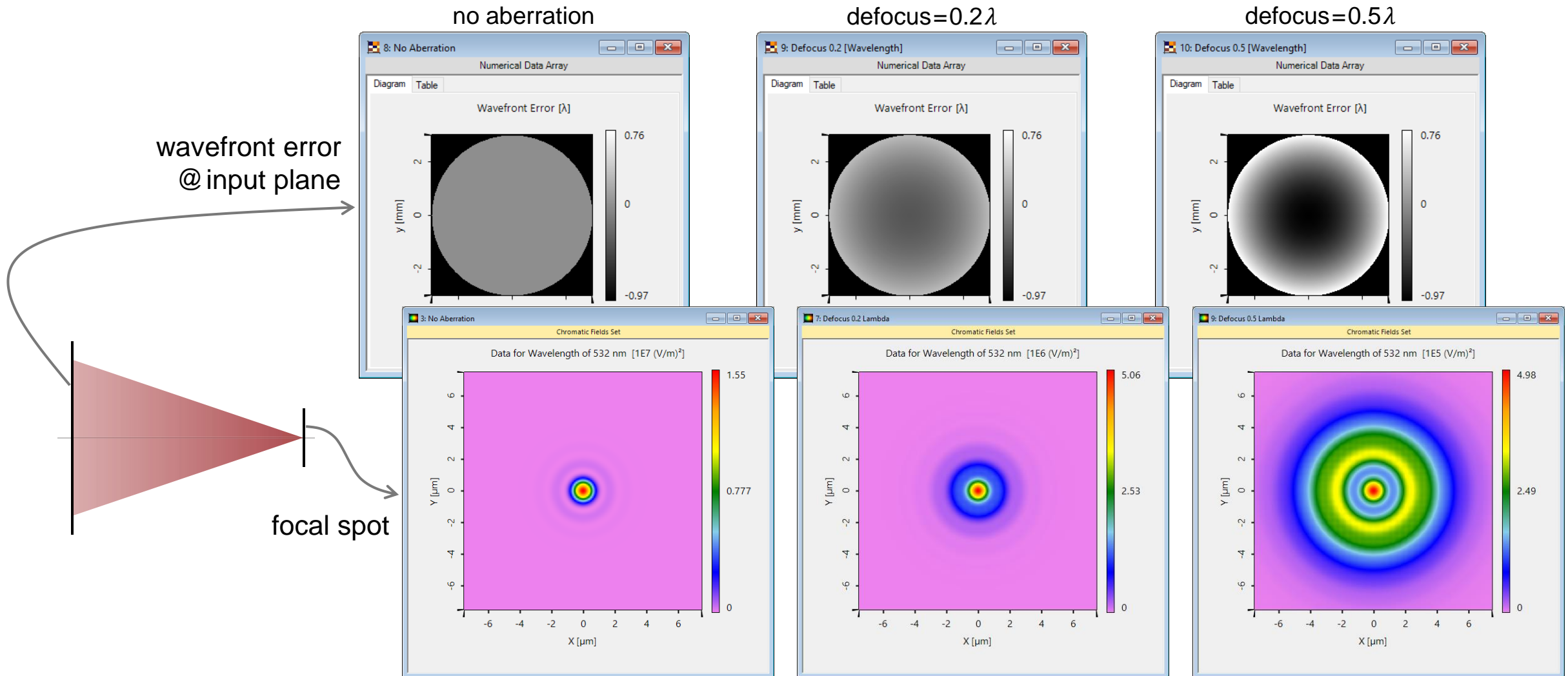


The *Zernike & Seidel Aberrations* component is a special type of transmission function that allows the user to define the desired aberrations and multiplies them onto the field, including:

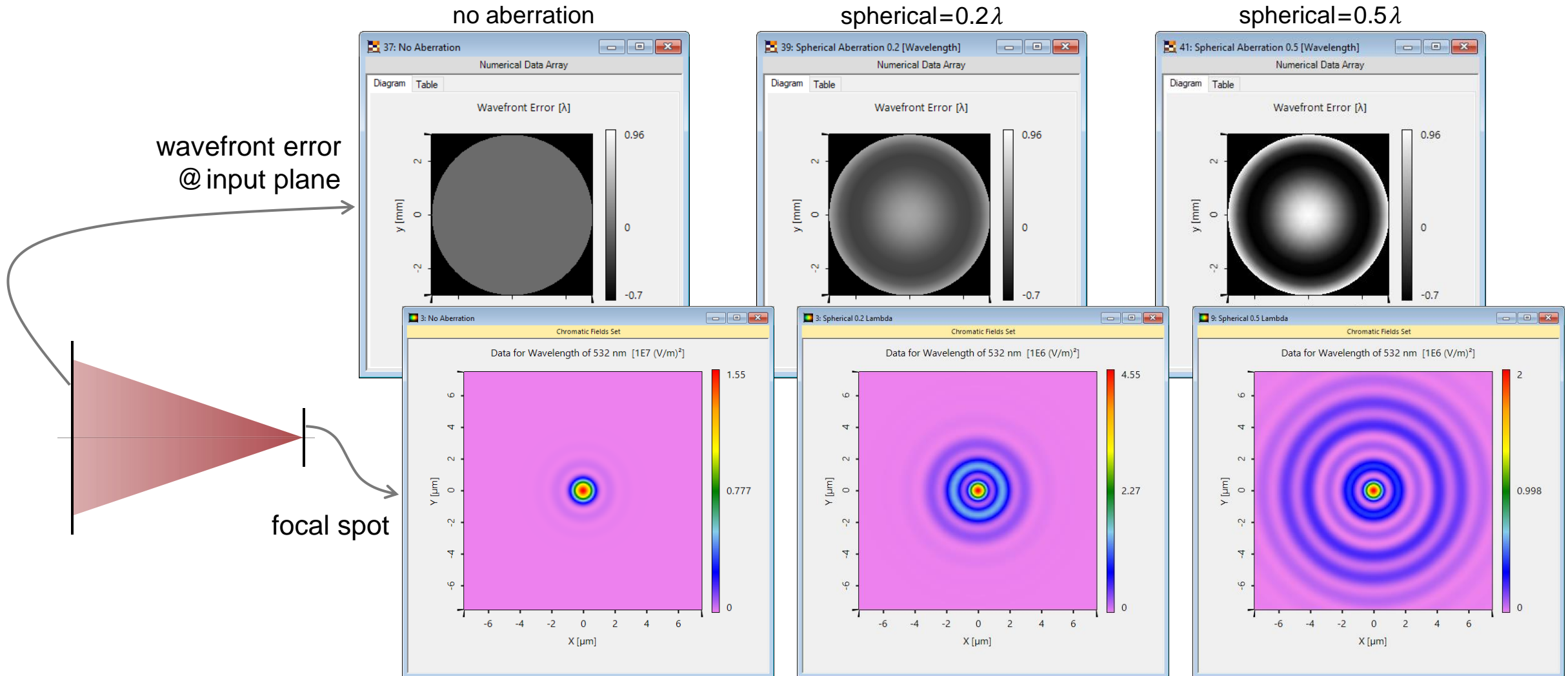
- defocus
- coma
- spherical aberration
- astigmatism



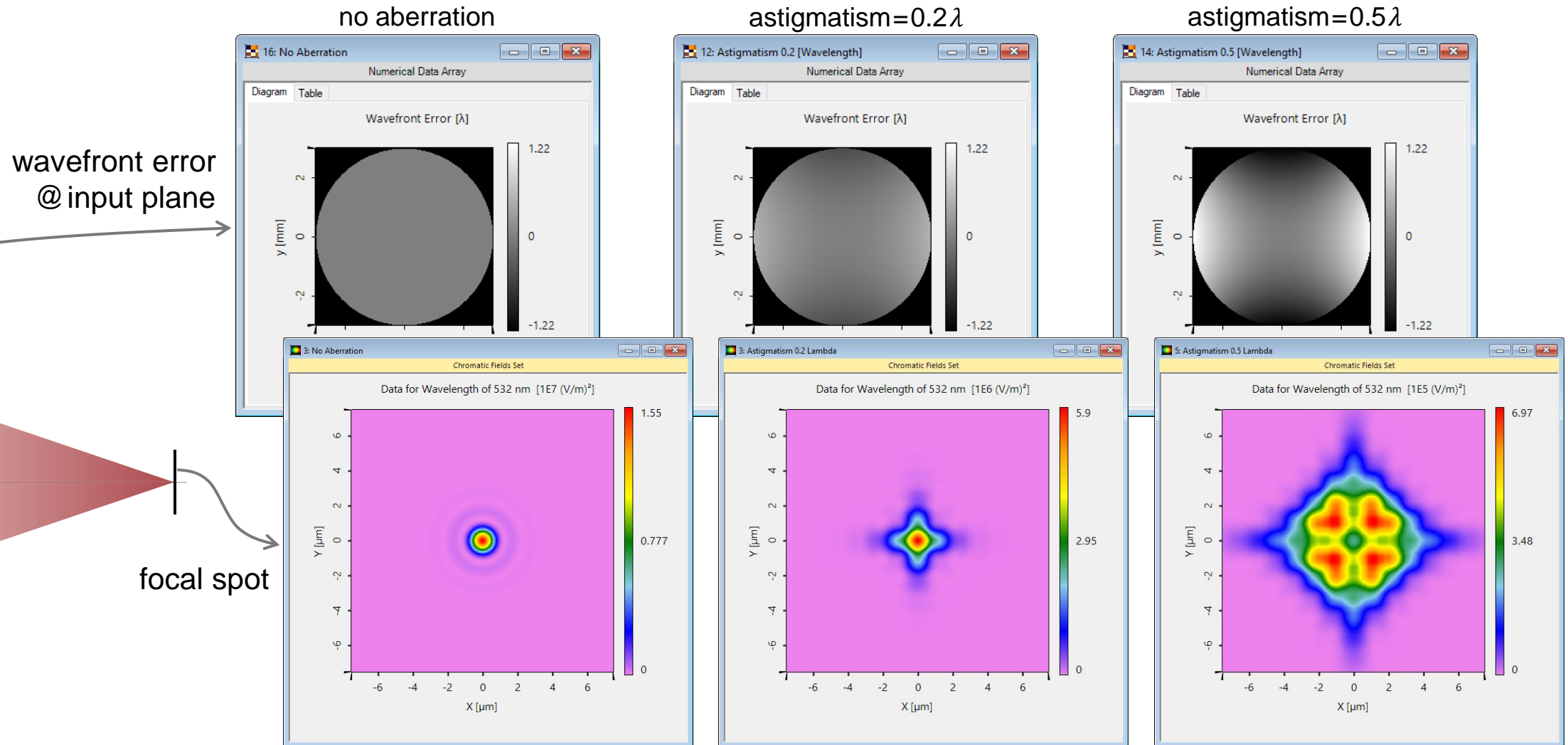
Defocus



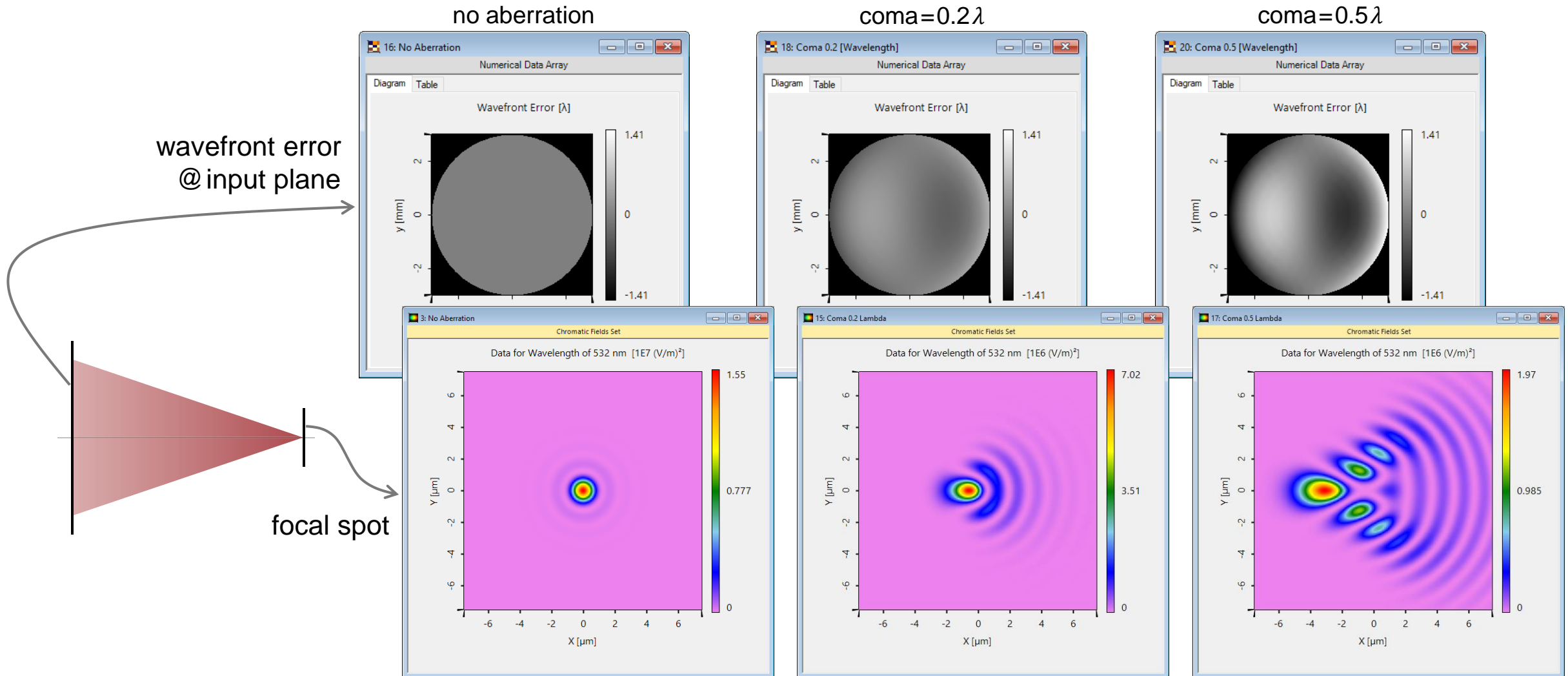
Spherical Aberration



Astigmatism



Coma



Secondary Coma

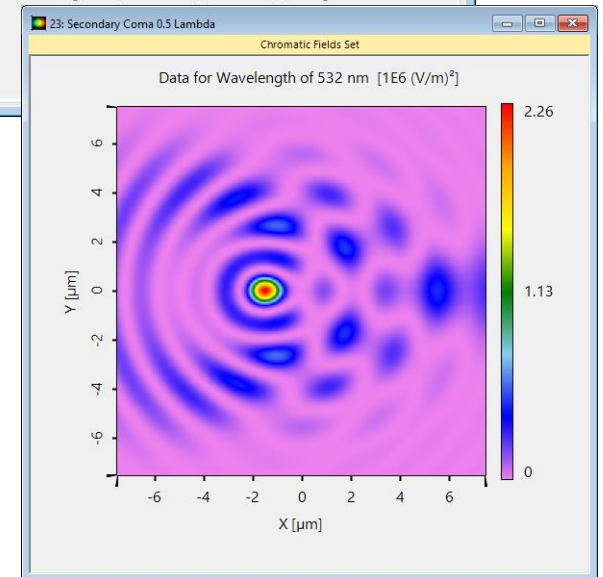
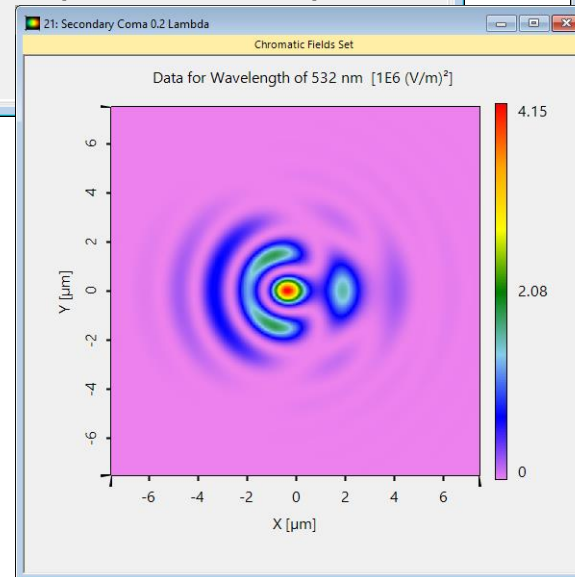
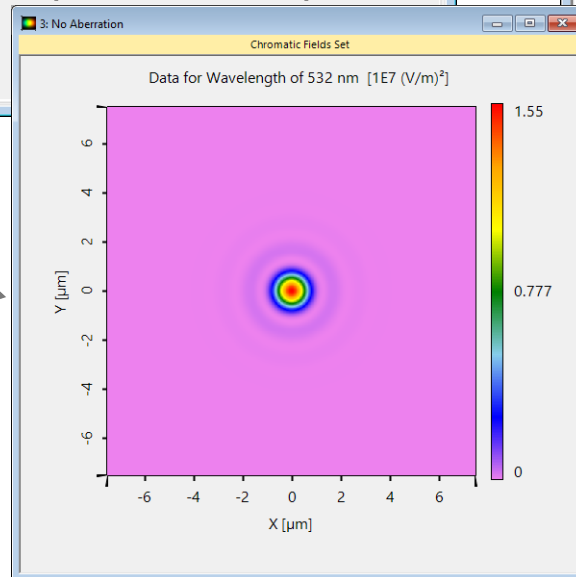
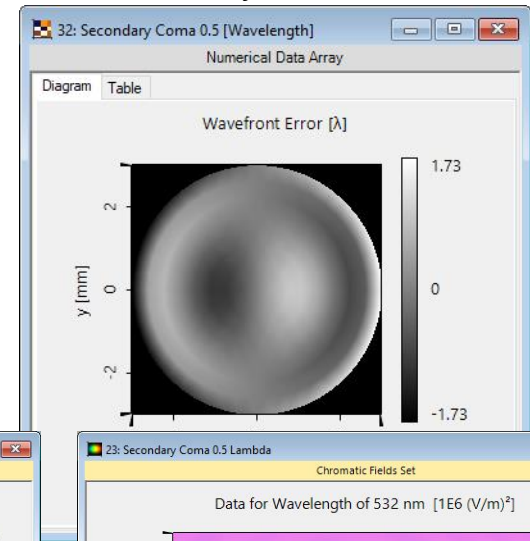
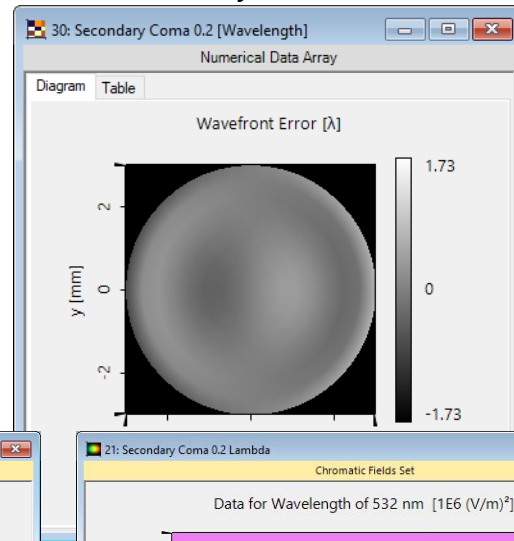
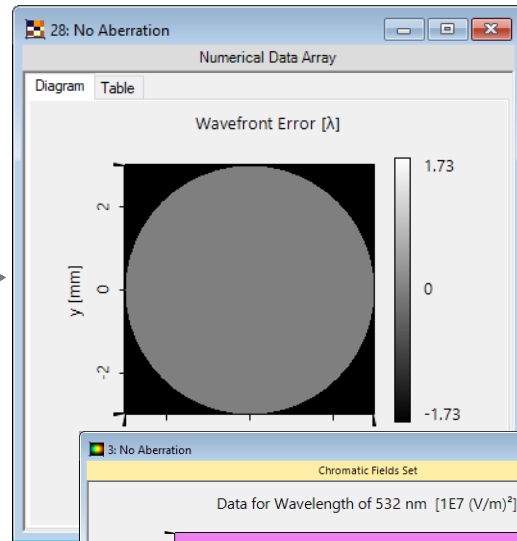
wavefront error
@ input plane

focal spot

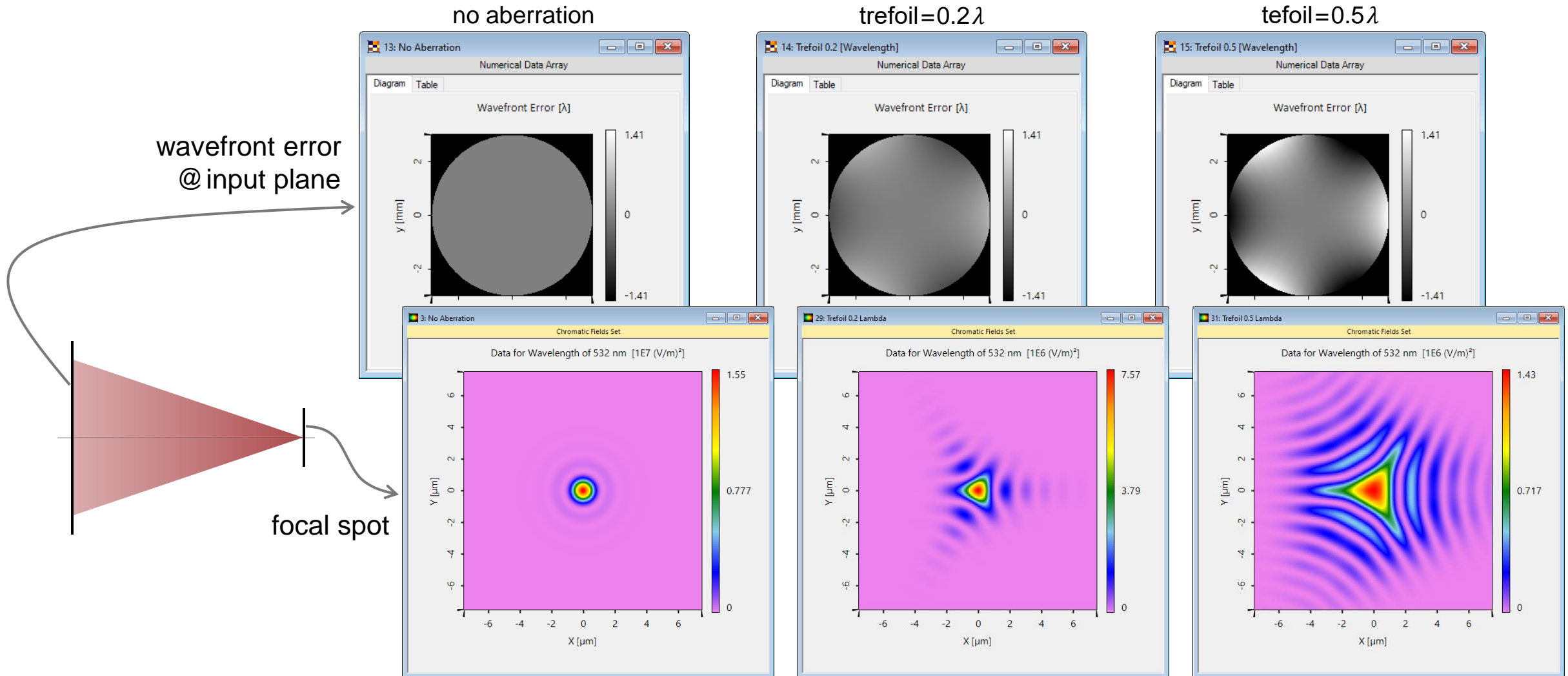
no aberration

secondary coma= 0.2λ

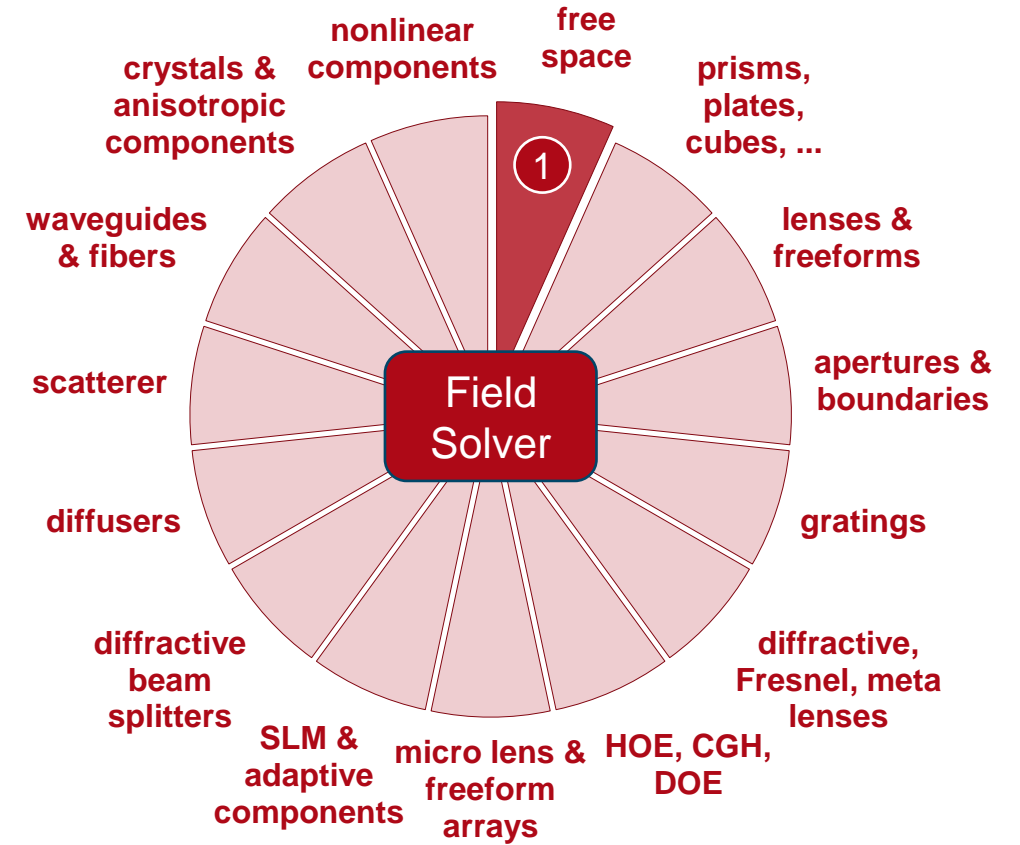
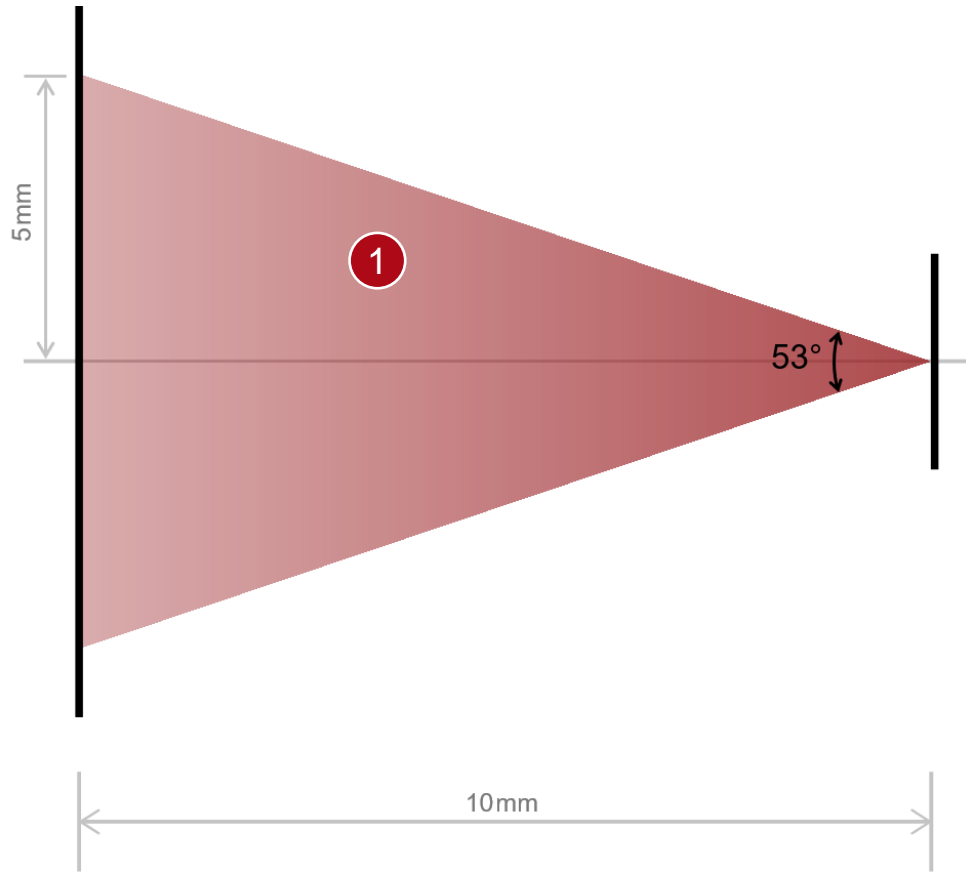
secondary coma= 0.5λ



Trefoil



VirtualLab Fusion Technologies



Document Information

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| category | Application Use Case |
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