

Physical-Optics Investigation of Light Coupling into Fiber and Micro-Optical Sensors



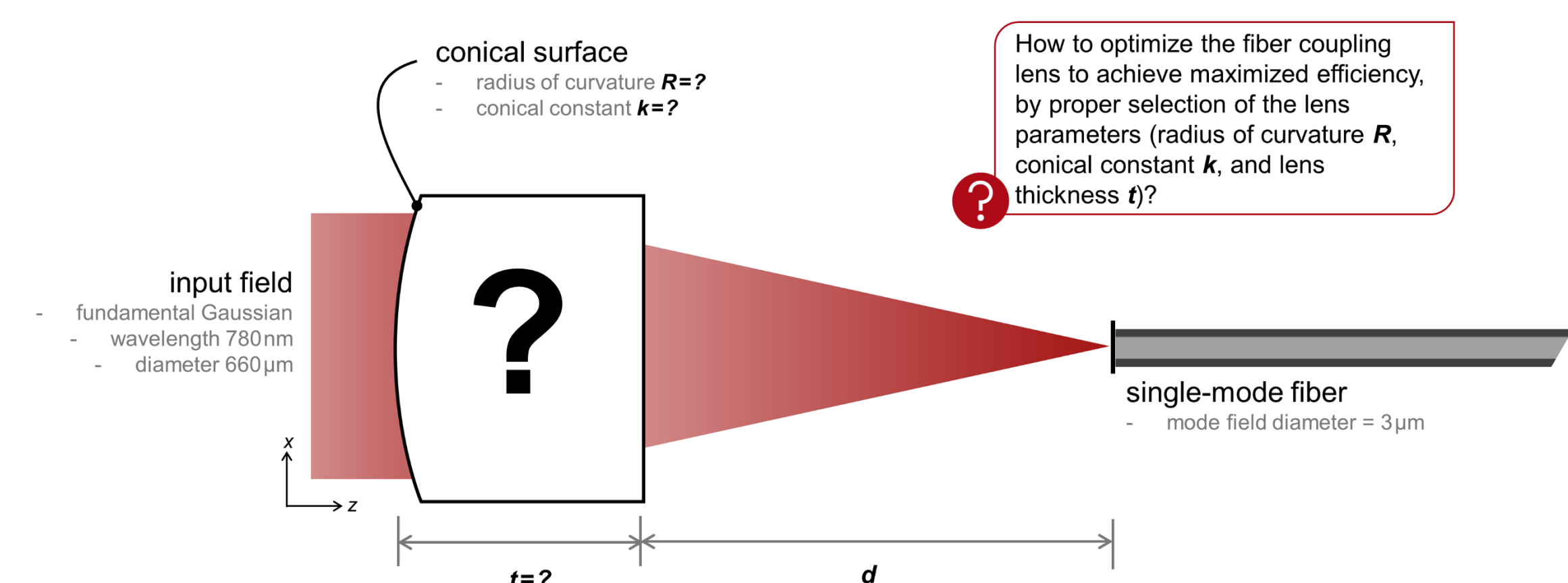
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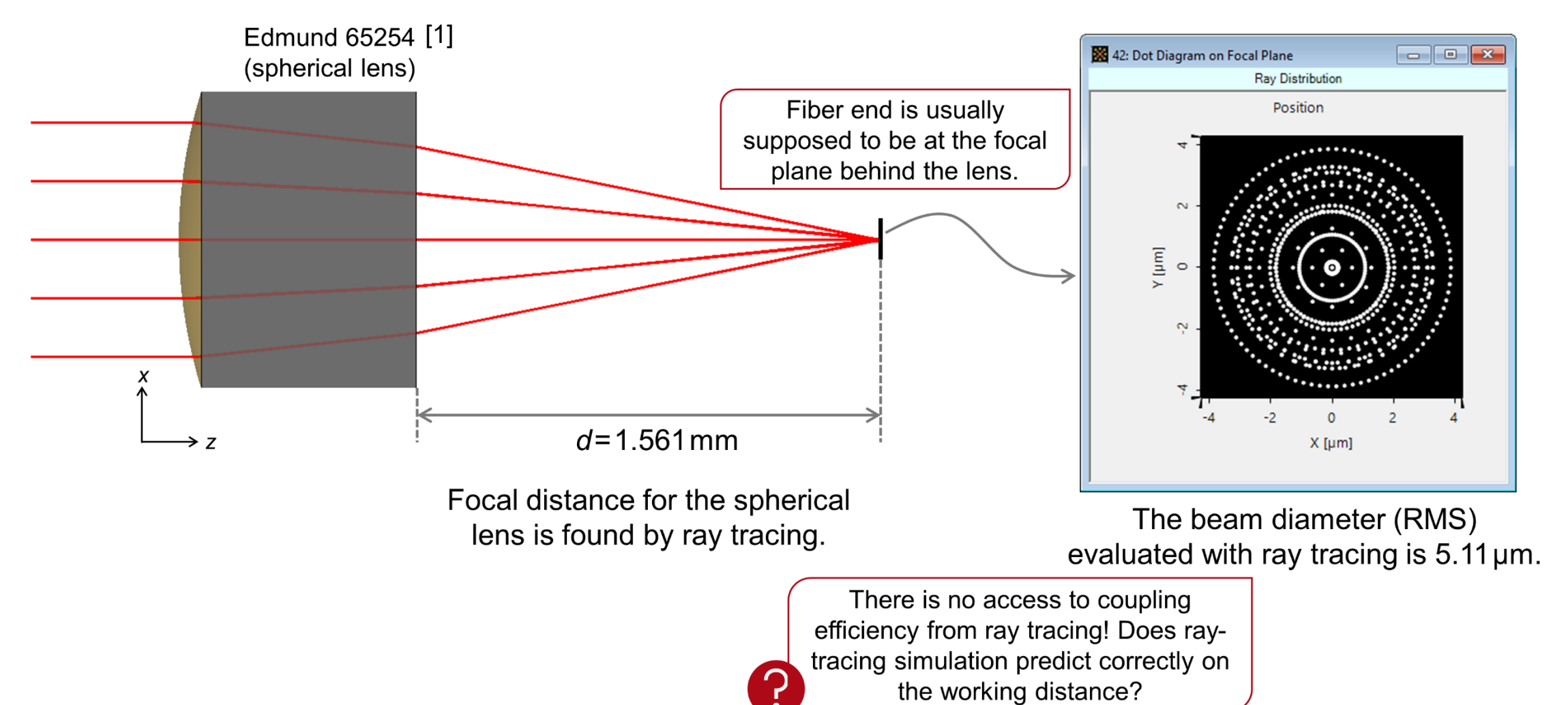
Design Task

1



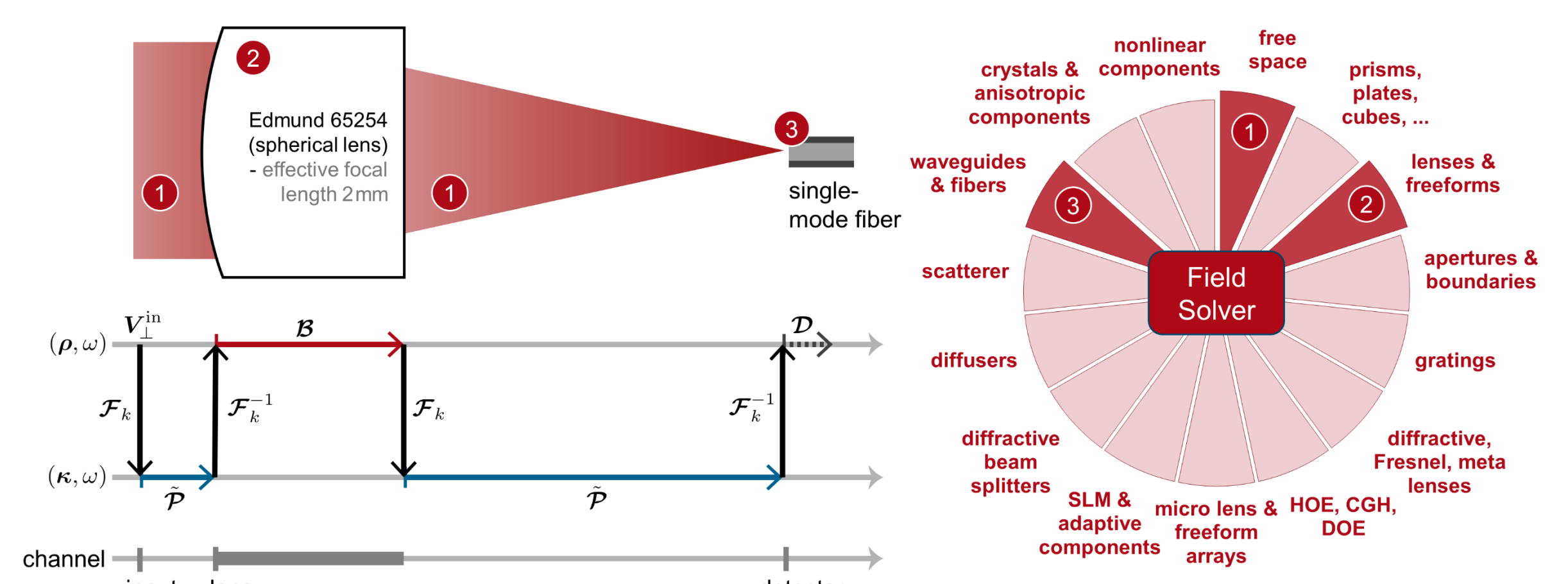
Challenges: Is Ray Optics Good Enough?

2



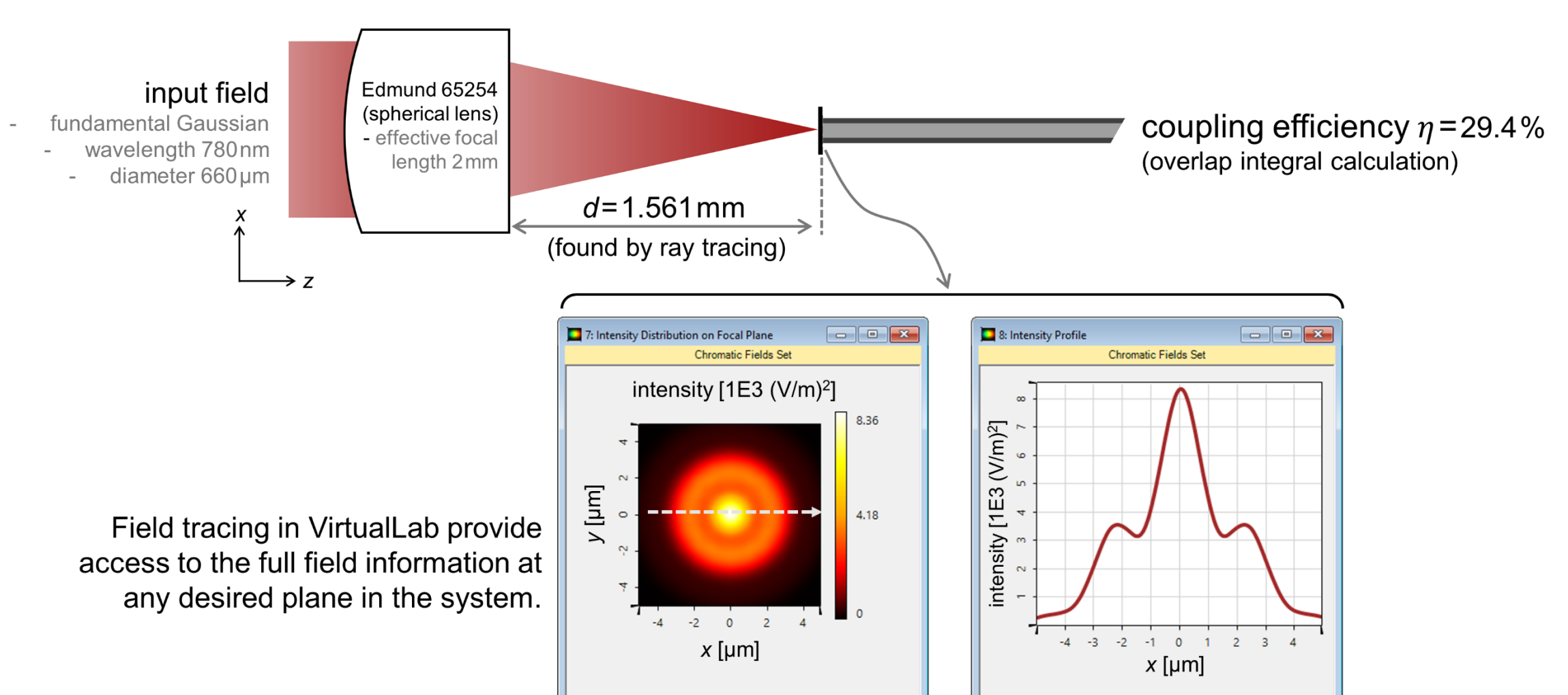
Field Tracing Technology [2]

3



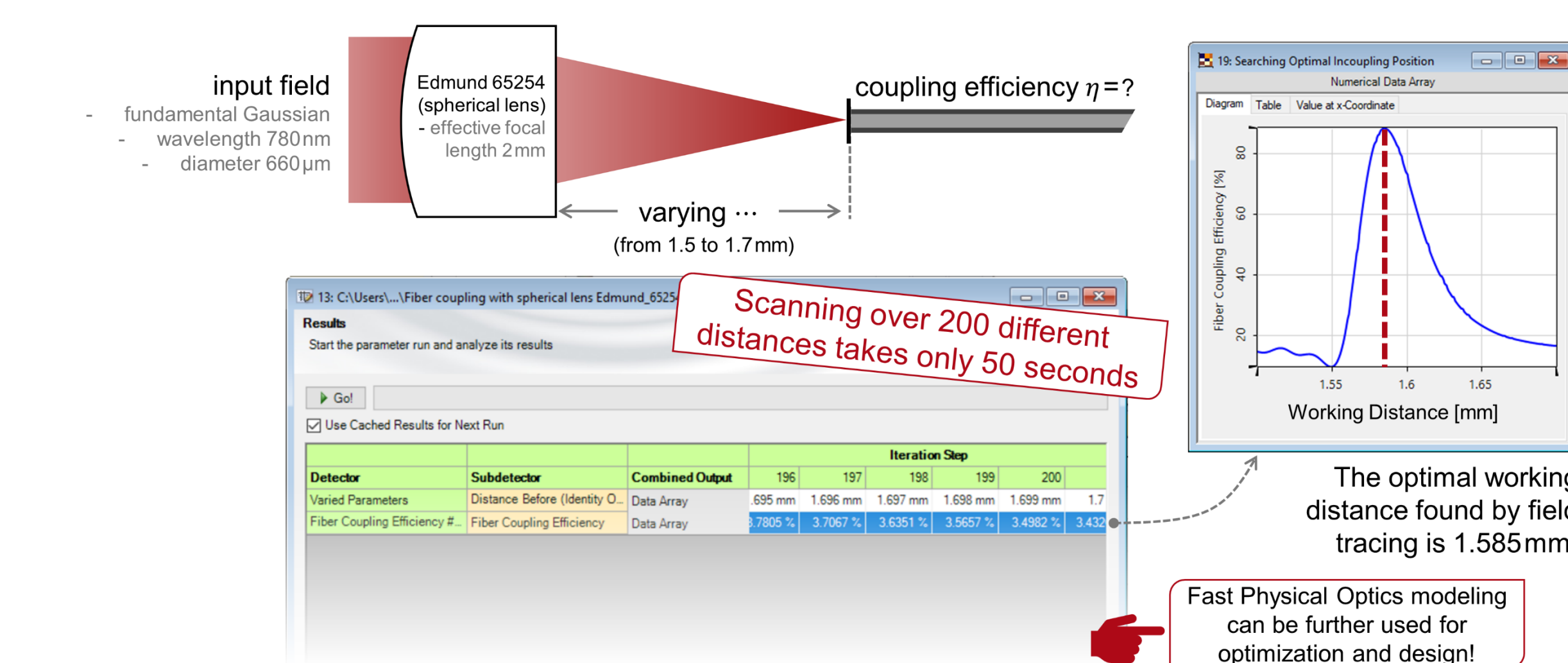
Field Tracing Evaluation at Ray-Optics Focal Distance

4



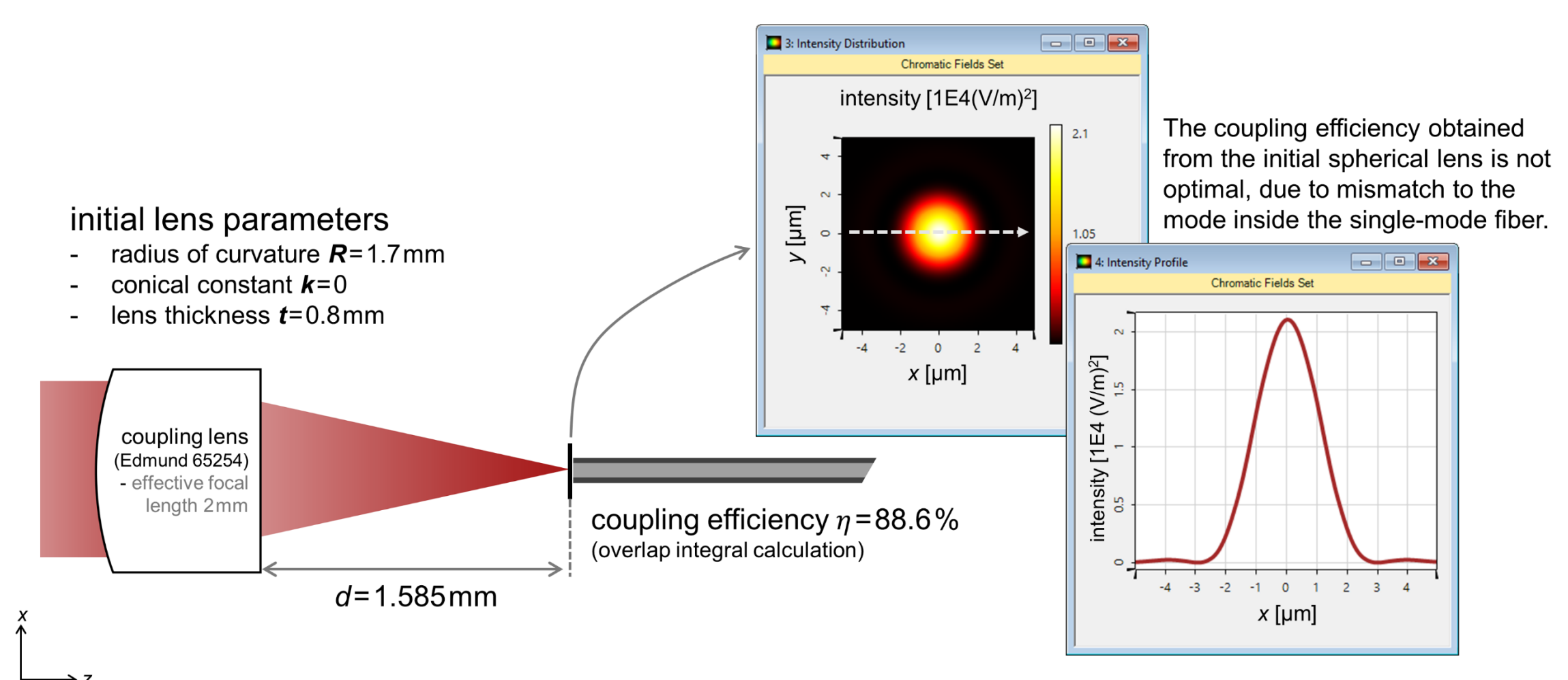
Find Optimal Working Distance by Using Field Tracing

5



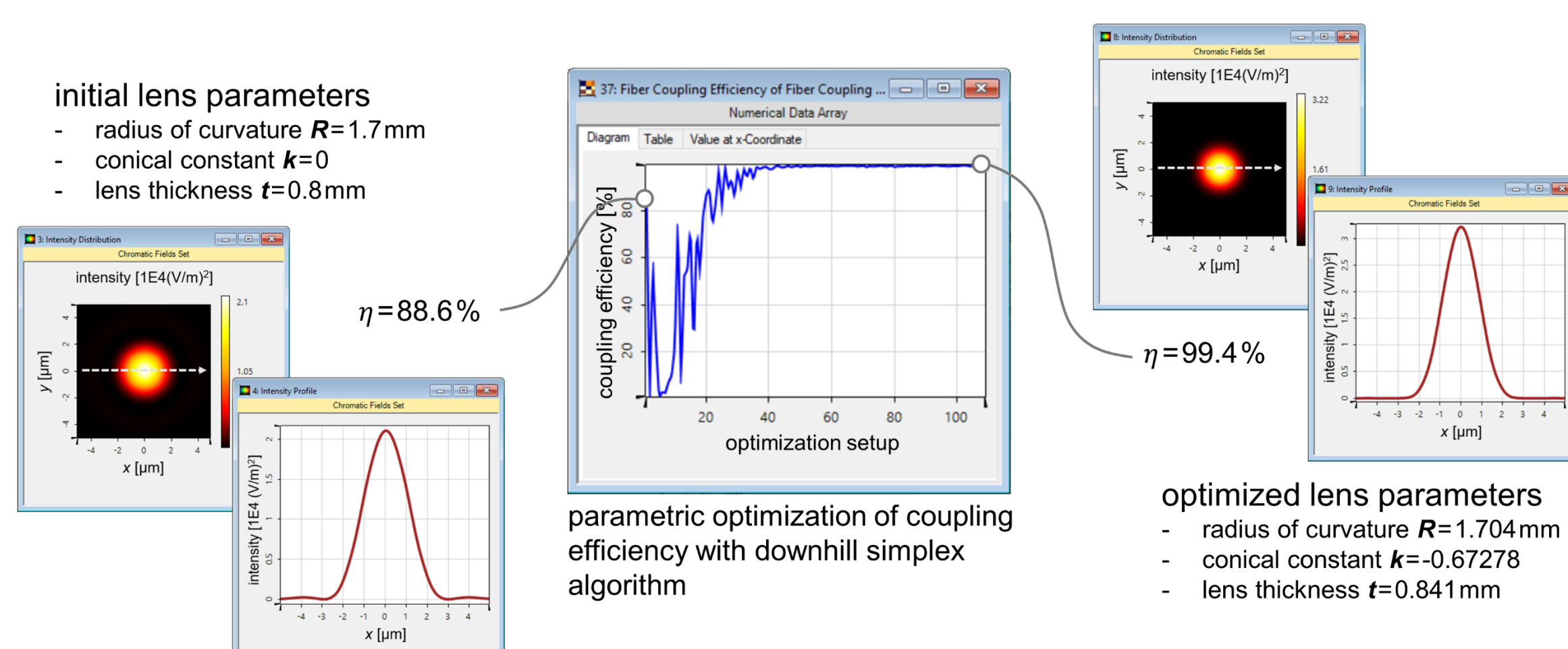
Initial Condition of Design

6



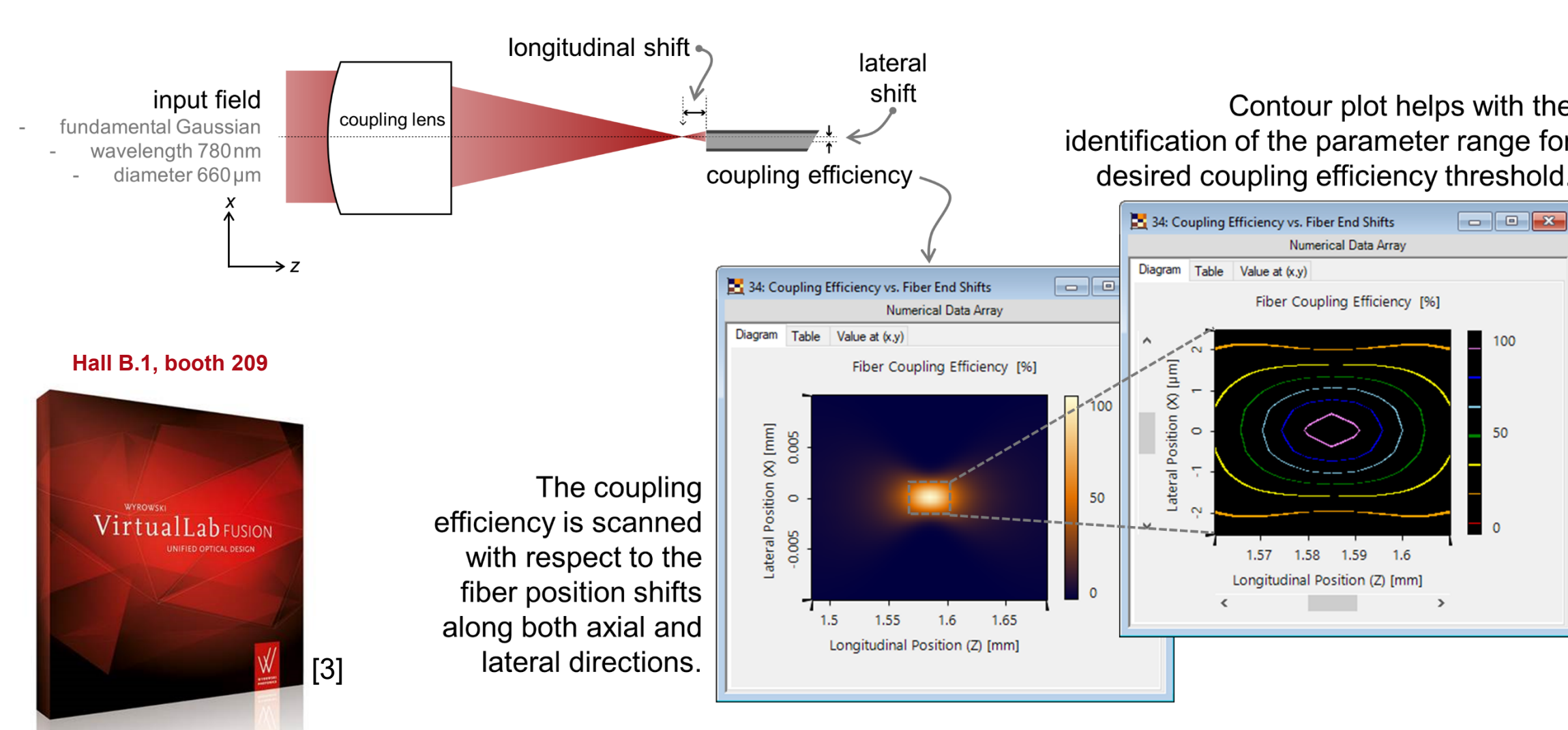
Parametric Optimization

7



Tolerance Analysis: Fiber End Position Shift

8



Bibliography

[1] Lens data is retrieved from Edmund Optics, www.edmundoptics.com

[2] The field tracing diagram is used to indicate the technologies and their computational domain in the modeling of an optical system. F. Wyrowski, "Unification of the geometric and diffractive theories of electromagnetic fields," Proc. DGaO, A36 (2017)

[3] All simulations are performed in the Fast Physical Optics software "Wyrowski VirtualLab Fusion," LightTrans International UG, Jena, Germany, www.LightTrans.com