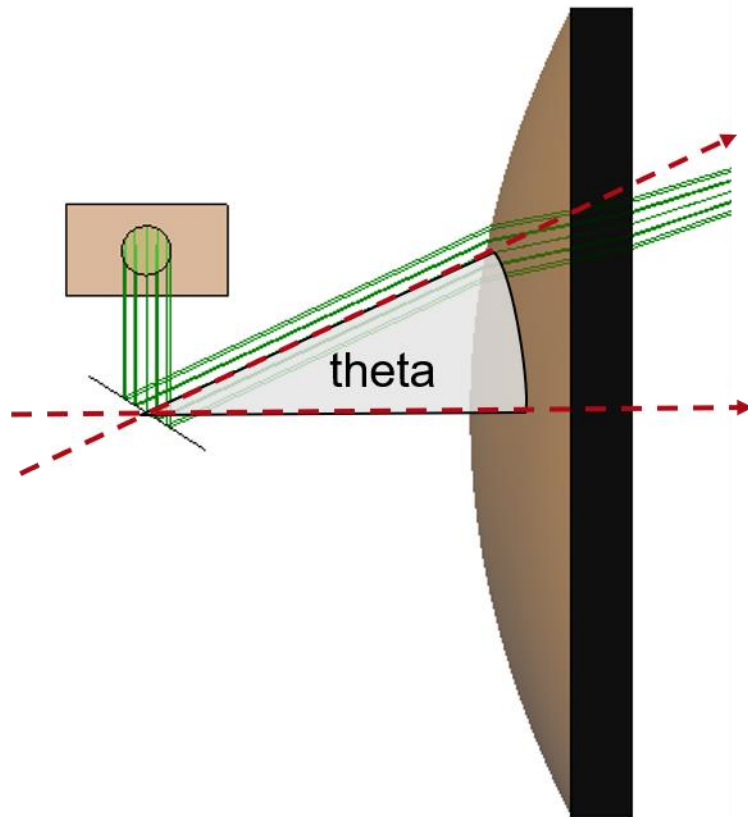


Performance Analysis of Laser Scanning System

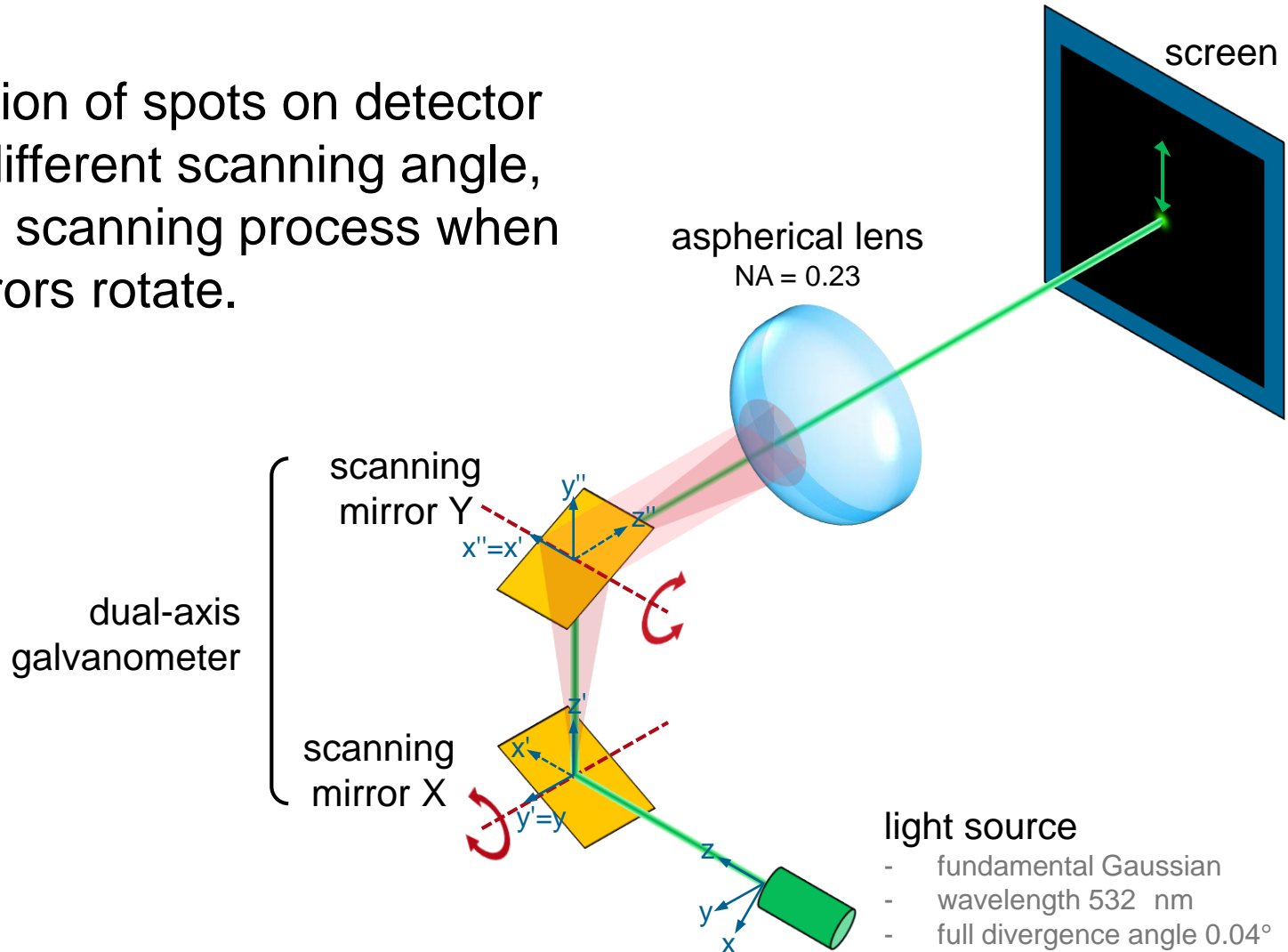
Abstract



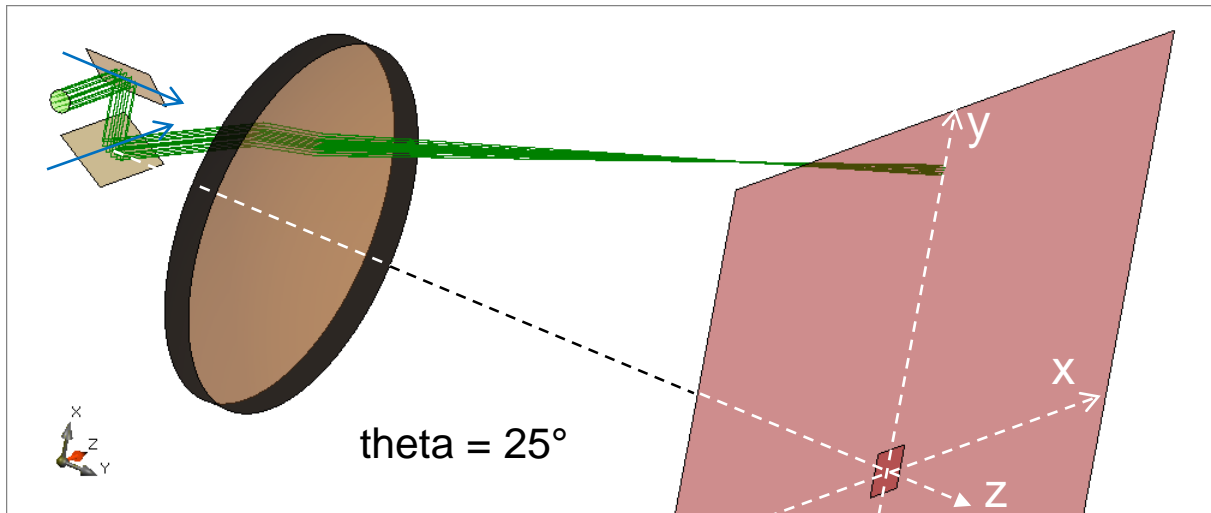
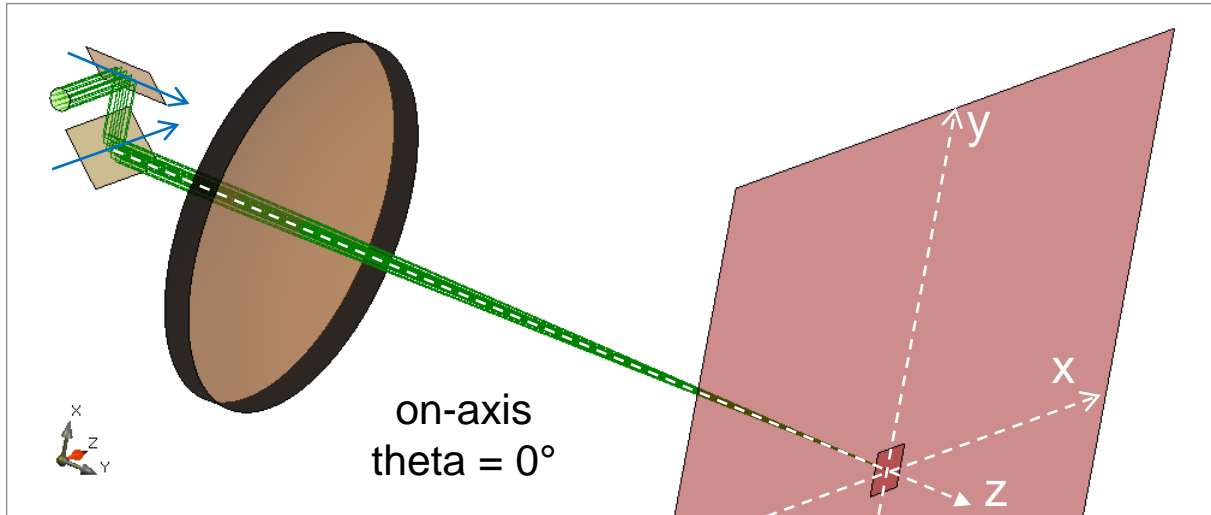
Laser scanning systems, with the help of e.g. a galvanometer, is capable of deflecting laser beams into predefined directions. And, in combination with focusing optics, such systems are often used for precise laser material processing. A scanning system consisting a dual-axis galvanometer and an aspherical focusing lens is modeled in VirtualLab. The rotation of the mirrors are modeled as in the practical case, and the focused laser spot at different scanning angles are examined.

Modeling Task

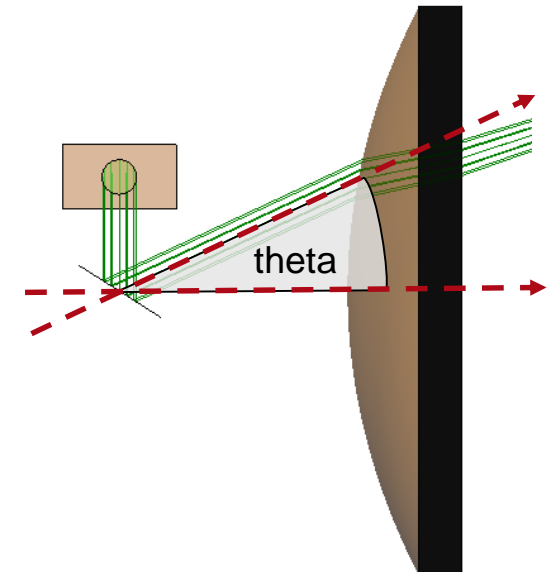
Simulation of spots on detector under different scanning angle, and the scanning process when the mirrors rotate.



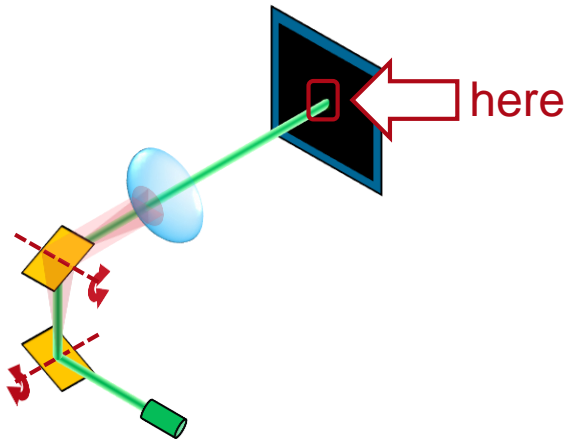
Results



Ray-tracing analysis gives a fast access to 3D view of the complete system.

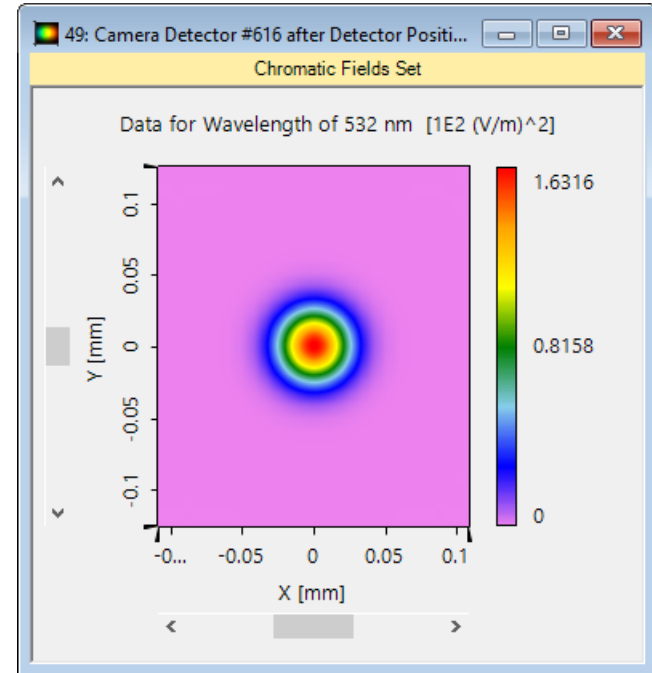


Results



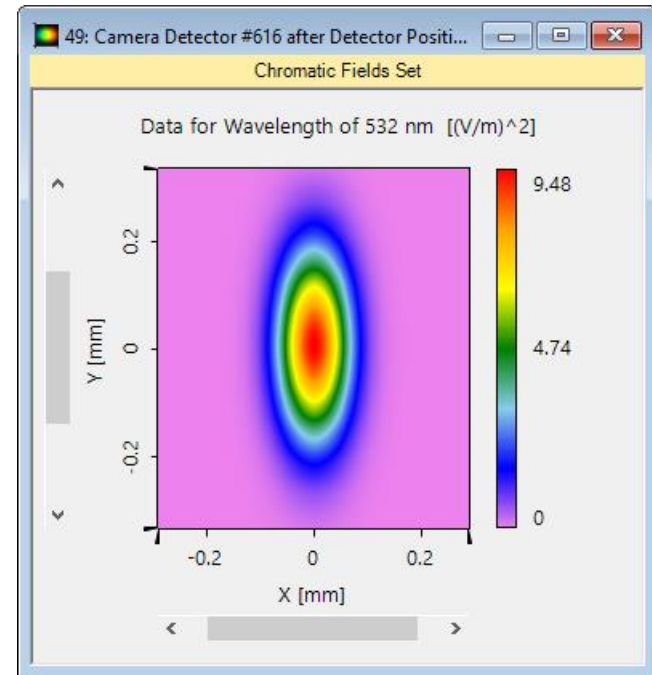
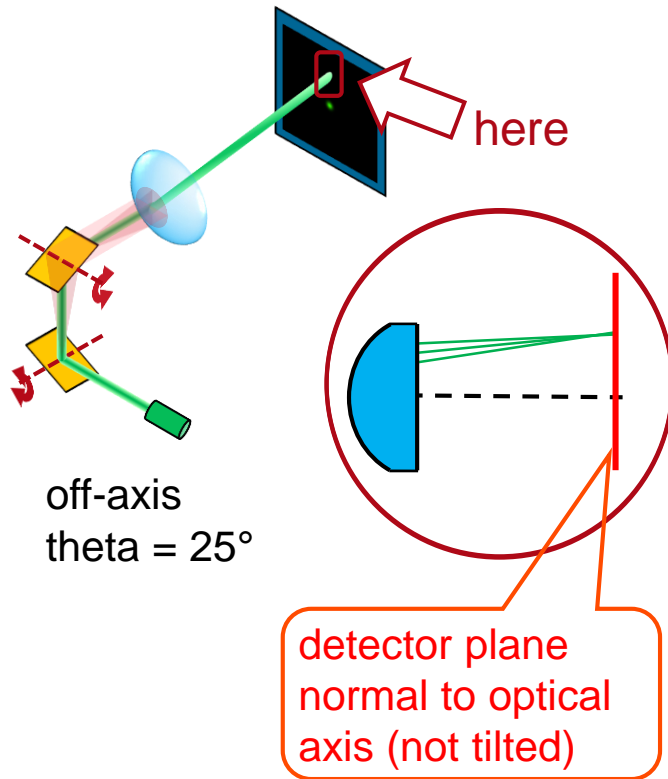
on-axis
 $\theta = 0^\circ$

Physical-optics
simulation of the
complete system
takes only 3 seconds.



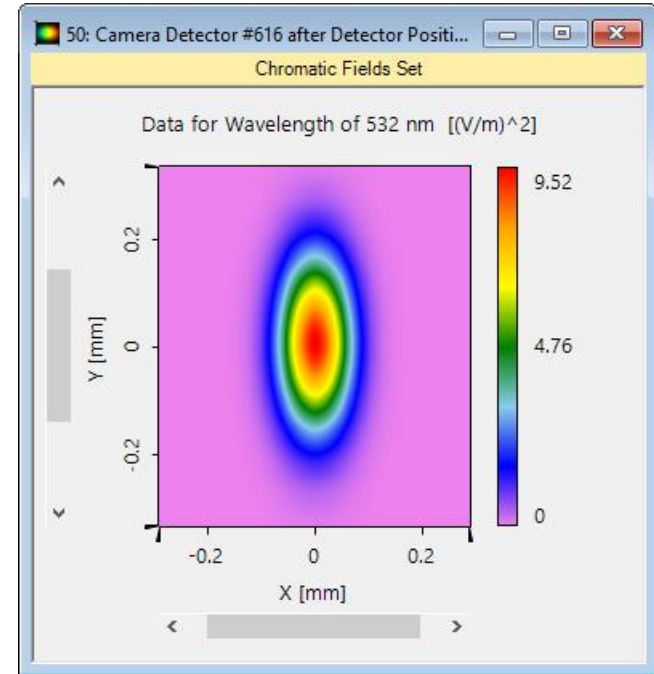
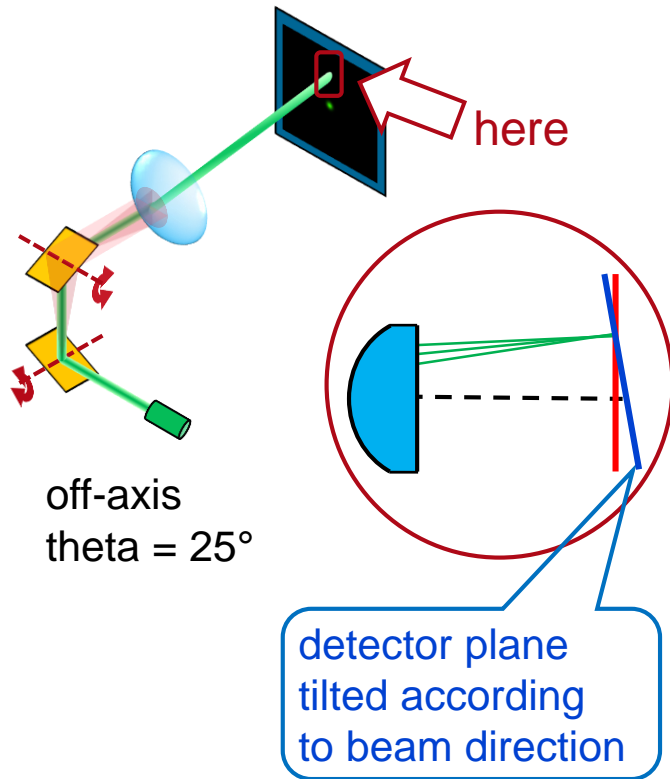
Parameters	Values
focus spot diameter	69.04 μm \times 69.04 μm

Results



Parameters	Values
focus spot diameter	$182.70\mu\text{m} \times 469.77\mu\text{m}$

Results



Parameters	Values
focus spot diameter	$182.76\mu\text{m} \times 431.11\mu\text{m}$

Document Information

title	Performance Analysis of Laser Scanning System
version	1.1
VL version used for simulations	7.4.0.45
category	Application Use Case
