Resolving Sodium Doublet by Using a Czerny-Turner Setup
Czerny-Turner setup is widely used to analysis the spectral information of light sources. Typically, a parabolic mirror is used to collimated the source first, and then a diffraction grating will spatially separate the colors spatially. In this example, a Czerny-Turner setup, consisting of reflective mirrors and diffractive gratings, for examining the Sodium doublet is presented. Particularly, the diffraction efficiency of the grating calculated with Fourier modal method (FMM).
Modeling Task

input spectrum
- Sodium doublet 588.995, 589.592 nm with equal weights
- linearly polarized

parabolic mirror 1
focal length 100 mm

parabolic mirror 2
focal length 100 mm

sawtooth grating
- period 833 nm
- modulation depth 282 nm

Output spectrum?
with rigorous consideration of diffraction efficiency of the grating
Simulation of full Czerny-Turner setup for examining Sodium doublet takes only 4 seconds.

wavelengths 588.995, 589.592 nm with equal weights

ray-tracing visualization of Sodium doublet separation
# Document Information

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