OSLO® Optical design software as an educational tool

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Simulation software

- Imitation of a real device or phenomenon
- Represent key characteristics or behavior
- Advantage: Eliminate or minimize the trial-and-error cost and time
- Example:
  - LTspice – circuit
  - OSLO – optical device
  - COMSOL – various physics
OSLO® Optical design software

- OSLO provides education edition without charge and request
- Limitation of Edu – up to 10 surface
Basic concept

- Surface (Surface x) – including object, lens surface, image
- Thickness (TH[x]) – Thickness between a surface to next surface
- Radius(RD[x]) – radius of surface
Basic concept

- Beam radius – the angle of beam that impinges on surface 1
- Field angle – the angle of second ray (blue)
- Effective focal length (Efl) – overall focal length

<Figure 3: data spreadsheet>
Simulation

- homework 4
Simulation – Lens 1

- Focal length – 20.03
- Refraction rate – 1.517
- Radius
  - Surface 1: 20
  - Surface 2: –20
- Not perfect or ideal
Simulation – Lens2

- Focal length – 49.04
- Refraction rate – 1.51
- Radius –
  - Surface 1: 50
  - Surface 2: -50
- Not perfect or ideal
Simulation – result

- Not perfect
- It’s about right
Conclusion

- Easy to use
- Great tool in class
  - Manually change the radius, aperture stop, and thickness of lens and see the ray trace
  - Not just dealing with perfect thin lens
Reference


