

Investigation #4 • APMA 935 • Geometrical Optics

- please respect page limits.
- working group should present oral update by 11 March.
- submit your final write-up Wednesday 17 March.

A) Wavefront (3 pages + plots) Consider a periodic grating with a sinusoidal index

$$N(x) = 1 + a \sin x$$

where $a < 1$. Using the ray equations, compute numerically the propagation of an initially flat wavefront ($y = 0$).

B) Transport (4 pages + plots) The text by Holmes (section 4.6) gives a presentation of ray methods which also includes an ODE treatment of the transport equation. Explain the Jacobian solution of the amplitude and calculate the solution for the periodic grating of part **A**) above.