Optics
IDC 202

Practise Assignment II *

April 6, 2018

1. Derive Ray-Transfer matrices for the following optical elements –

   (a) Translation through a medium of refractive index n.

   (b) Refraction at a plane interface, separating media with refractive indices n_1 and n_2.

   (c) Refraction at a spherical interface with radius of curvature R. Assume the two media have refractive indices n_1 and n_2. Does the result go over to the previous case when $R \to \infty$?

   (d) Thick lens and thin lens.

   (e) Spherical mirror surface of radius of R. What happens when $R \to \infty$? Does it make sense ?

2. In an optical setup, the product of all individual ray-transfer matrices is called the *system matrix*. With clear schematic diagrams and quantitive expressions deduce the physical significance of the various elements in the system matrix.

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*These practise assignments will not be graded, but are important for understanding the course material and evaluation components may be based on these.

3. Find the position of the image plane and the size of the image.

Object Plane   0.25 m   f=0.08m   0.06 m   f=0.12m   x   **Image Plane**