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Assignments chapter 15

TASK 1

Problems for 15.1 – Ex. 1 - page 592 of the book “Laser” by Siegman

Suggestions:

- Use small angles approximation;
- Consider the thickness of the interface $t = 0$ m.

TASK 2

Consider an optical resonator of length L made by two intracavity lenses of focal length f =2L equally spaced between two flat end mirrors.

a. The system is aligned. Find the general ABCD matrix of the system for any round trip in the resonator.
b. The system is misaligned. The first lens is displaced below the optical axis of a distance $\Delta_a = 2\varepsilon$ and the second lens is displaced upward of a distance $\Delta_b = \varepsilon$. Calculate the overall element axis passing through the two lenses. Consider the two lenses grouped in a single element of dimension P= 2/3L, cantered in L/2. Calculate the misalignment of the element respect the reference axis Δ’ and considering the element described by a general matrix ABCD, write the general equations for E and F.
   Suggestion: Consider the thin lenses approximation.