

1. Two-layer glass slab model

a. (15 pts) Derive the *general* formulae for I_1 , I_2 , and I_G for the two layer glass slab model. ‘General’ here means that a_{s1} , a_{s2} , a_{L1} , and a_{L2} are allowed to have *different* values, unlike the example worked out in Chapter 3 equations (3.11)-(3.13). Simplify your formulae to be expressed as:

$$I_2 = C_2 I_{IN} \quad , \quad I_1 = C_1 I_{IN} \quad , \quad \text{and} \quad I_G = C_G I_{IN} \quad .$$

Find the equations for constants C_2 , C_1 , and C_G in terms of a_{s1} , a_{s2} , a_{L1} , and a_{L2} . The formulae simplify and ultimately have fewer parts than shown in formulae (3.11) – (3.13) in Chapter 3.

b. (15pts) Problem 5a at the end of Chapter 3 using the formulae you derived in part a.).

c. (2 pts) Problem 5b at the end of Chapter 3.

The derivation of **part a.) is due on 15 October** at the start of class. At that time, the solutions for C_2 , C_1 , and C_G will be handed out to avoid catastrophic loss of points on the later parts. Part b.) can be done using a spreadsheet or a computer program. **Parts b.) and c.) are due on 17 October.**

NOTE: all homework is to be done by you as an INDIVIDUAL: no ‘group’ efforts, please. For written answers, please use a word processor, so that penmanship is not an issue. Equations and derivations can be *neatly* hand-written.

Any plot must be completely and unambiguously labeled, including title and axes.