FYS4630 Oppgaver Onsdag 1. november 2006

Oppgave 1

Vi har en planparallell atmosfære med innkommende parallell stråling med $F^s = 1$ og $\mu_0 = 0.5$. Beregn $I^-(\tau^*, u)$ for u i intervallet [-1,0). Bruk både singel spredningsapproksimasjonen (Problem 7.1.a) og DISORT. Anta isotrop spredning og single scattering albedo = 1.0. Beregn for $\tau^* = 0.05$ og $\tau^* = 1.0$. Kommenter resultatene.

Oppgave 2

Use DISORT in the next problem:
Assume an atmosphere with two layers, and an incoming parallel beam at the top with F_s =1.0 and μ_0 = 0.5. The lower boundary of the atmosphere is a Lambert reflector.
Assume no internal thermal sources. Assume isoptropic scattering in both layers.

a) Layer 1: optical thickness=1.0
Layer 2: optical thickness=1.0
Compute the downward direct, downward diffuse and total downward fluxes at the surface for the following cases:

i) a=1.0 for layer 1, a=1.0 for layer 2, surface albedo A_g= 0.0
ii) a=1.0 for layer 1, a=0.4 for layer 2, surface albedo A_g = 0.0
iii) repeat i) with surface albedo A_g = 0.9
iv) repeat ii) with surface albedo A_g = 0.9

Compare the downward fluxes in i), ii), iii) and iv)
What are the physical explanations for the differences?

b) Use an optical depth $\Delta\tau_1$ = 100 for layer 1. This can represent an optically thick non-absorbing cloud.

Repeat i), ii), iii) and iv).
What is the effect of increasing the surface albedo in b) compared to a)?