

FYS4630/FYS9630

Assignment #3 Wednesday October 1, 2014

1) Problem 5.2

- 2) Solar flux at the top of the atmosphere is F^s . Cosine to the solar zenith angle is μ_0 . Assume isotropic scattering. Consider single scattered radiation only. Explain why the radiative transfer equation for $I^-(\tau, \mu, \varphi)$ to be solved is (use Eq 6.6. and Eq. 6.7 on page 172) :

$$-\mu \frac{dI^-(\tau, \mu, \varphi)}{d\tau} = I^-(\tau, \mu, \varphi) - \frac{a}{4\pi} F^s e^{-\tau/\mu_0}$$

What is the intensity of solar radiation that has been scattered only once at optical depth, $I^-(\tau, \mu, \varphi)$ if $\mu \neq \mu_0$?

What is $I^-(\tau, \mu = \mu_0, \varphi)$?