

ECEn 560
Electromagnetic Wave Theory

Homework #11

Due Feb. 23, 2016 (may be turned in late for half credit)

1. (a) Review the derivation of the cylindrical wave expansion of the field radiated by a VMD on a half-space dielectric material. (b) Draw a sketch that illustrates the wave represented by the integrand evaluated at a given value of k_ρ .
2. An A-sandwich radome designed for an operating frequency of 10 GHz is fabricated from a thin epoxy layer (thickness 1 mm, $\epsilon_r = 4$, $\tan \delta = 0.01$), a thicker layer of light honeycomb for mechanical strength (6 mm, $\epsilon_r = 1.1$, $\tan \delta = 0.002$), followed by a second identical epoxy layer. Write a matlab code to compute the h-pol reflection and transmission coefficients for the radome as a function of incidence angle (see the figure below). Turn in a printout of your code and a plot of the reflection and transmission coefficient magnitudes. Can you design a better radome?

