These problems are due Friday, April 29.

1. Two plane semi-infinite slabs of the same uniform, isotropic, nonpermeable, lossless dielectric with index of refraction $n$ are parallel and separated by an air gap ($n = 1$) of width $d$. A plane electromagnetic wave of frequency $\omega$ is incident on the gap from one of the slabs with angle of incidence $i$. Assume that the polarization is perpendicular to the plane of incidence.

   (a) Calculate the ratio of power transmitted into the second slab to the incident power and the fraction of reflected to incident power;

   (b) For $i$ greater than the critical angle for total internal reflection, sketch the ratio of transmitted power to incident power as a function of $d$ measured in units of wave length in the gap.