

Example 3

Polarizing Sun glasses

orient such that Sun is at the Brewster's angle

$$\theta_B = \tan^{-1} \left(\frac{n_2}{n_1} \right)$$

$$\theta_B = 53.06^\circ$$

$$\Gamma_{||} = 0$$

$$\Gamma_{\perp} = -0.2778$$

Polarizer on glasses set to block \perp

Now look at a fish

$$\theta_i = 36.94^\circ$$

$$\theta_t = 53.06^\circ$$

$$n_1 = \frac{377}{1.33}$$

$$n_2 = 377$$

$$\Gamma_{||} = 0.08747$$

$$\Gamma_{\perp} = 0.1950$$

Fraction of received power is $0.5(1 - |\Gamma_{||}|^2) + 0.5(1 - |\Gamma_{\perp}|^2)$

the \perp component gets blocked by polarizer

$$\text{so power} = 0.5(1 - (0.08747)^2) = 0.4962$$

