Table of contents

Reflection and Transmission, reflection amplitude coefficients:

$$a_{r\parallel} = \frac{\mathcal{E}_{0,r\parallel}}{\mathcal{E}_{0,\alpha\parallel}} = -\frac{sin(\alpha - \beta)}{sin(\alpha + \beta)} \tag{1}$$

$$a_{r\perp} = \frac{\mathcal{E}_{0,r\perp}}{\mathcal{E}_{0,\alpha\perp}} = \frac{tan(\alpha - \beta)}{tan(\alpha + \beta)} \tag{2}$$

Reflection:

$$A_r = \frac{P_r}{P_\alpha} = \frac{a_{r\perp}^2 \mathcal{E}_{0,\alpha\perp}^2 + a_{r\parallel}^2 \mathcal{E}_{0,\alpha\parallel}^2}{\mathcal{E}_{0,\alpha\perp}^2 + \mathcal{E}_{0,\alpha\parallel}^2} \tag{3}$$

transmission amplitude coefficients:

$$a_{t\parallel} = \frac{\mathcal{E}_{0,t\parallel}}{\mathcal{E}_{0,\alpha\parallel}} = 2\frac{sin(\alpha)sin(\beta)}{sin(\alpha + \beta)} \tag{4}$$

$$a_{t\perp} = \frac{\mathcal{E}_{0,t\perp}}{\mathcal{E}_{0,\alpha\perp}} = 2\frac{sin(\alpha)sin(\beta)}{sin(\alpha + \beta)cos(\alpha - \beta)} \tag{5}$$

Transmission:

$$A_t = \frac{P_t}{P_\alpha} = \frac{a_{t\perp}^2 \mathcal{E}_{0,\alpha\perp}^2 + a_{t\parallel}^2 \mathcal{E}_{0,\alpha\parallel}^2}{\mathcal{E}_{0,\alpha\perp}^2 + \mathcal{E}_{0,\alpha\parallel}^2} \tag{6}$$

$A_r + A_t = 1$

Finess (Sharpness, Linedistance, "Halbwärtsbreite"):

$$\mathcal{F} = \frac{4a_r^2}{(1 - a_r^2)^2} = \text{finess coefficient)} \tag{7}$$

$$\mathcal{F} = \frac{\pi}{2}\sqrt{\frac{4a_r^2}{(1 - a_r^2)^2}} = \frac{\pi}{2}\sqrt{\mathcal{F}} \tag{8}$$