

# The 9th HW of Electrodynamics

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2019 年 5 月 5 日

## 1

There is an uniform dielectric film of thickness...

For normal incidence, we have

$$R_s = R_p = \left| \frac{\hat{n}_2 - n_1}{\hat{n}_2 + n_1} \right|^2 = \frac{(n - n_1)^2 + \kappa^2}{(n + n_1)^2 + \kappa^2} = 0$$
$$\implies n = n_1 = \sqrt{\varepsilon\mu}, \kappa = 0$$

## 2

Find a method to measure the optical coefficients...

As

$$R_s = \left| \frac{\sin(\theta - \theta_t)}{\sin(\theta + \theta_t)} \right|^2 \quad \text{and} \quad R_p = \left| \frac{\tan(\theta - \theta_t)}{\tan(\theta + \theta_t)} \right|^2$$

用上面两个式子中的一个, 控制  $\theta$ , 偏振方向, 测量反射率, 可以算出  $\theta$ . 而  $\hat{n} = n + i\kappa = \frac{\sin \theta}{\sin \theta_t} n_1$ . 当环境是真空,  $n_1 = 1$ . 即得到  $n = \text{Re}(\hat{n}), \kappa = \text{Im}(\hat{n})$ .

如果测量多个点, 利用最小二乘法计算, 可以减小误差.