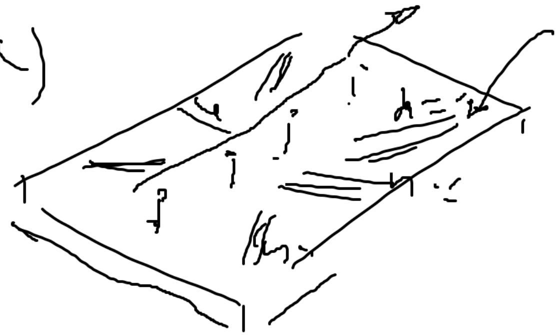
FIG 2

(a)

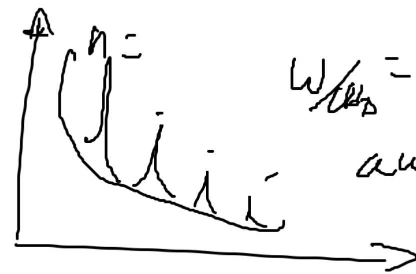


embedded color plot

→ program

→ by hand

(b)



ω/ω_D = —

$a\omega_D/v$ =

$a, \lambda_p \ll b$

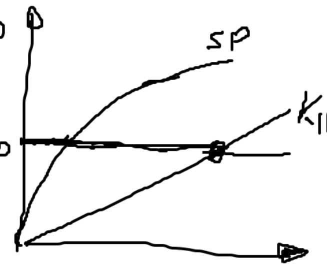
z_0

$v \ll c$

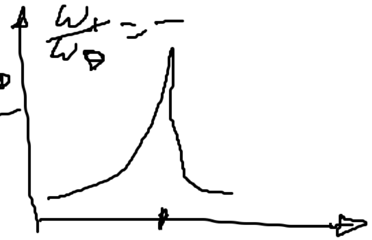
(a)

FIG. 1

(b)



(c)



(d)

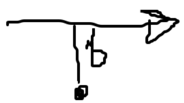
→ indep. of b, v ?

$$\sigma = \frac{e^2}{\hbar}\,\frac{i\omega_D}{\omega + i\gamma}$$

$\omega_D = E_F/\hbar$ in graphene

$$\lambda_p = \frac{4\alpha}{\epsilon+1}\,\frac{\omega_D}{\omega}$$

(Ag, hBN, Sr → SI)

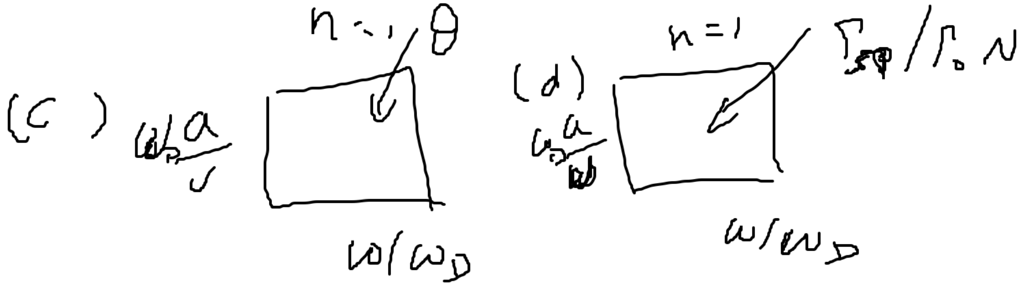


Γ_0

≃

dipole E.F.W

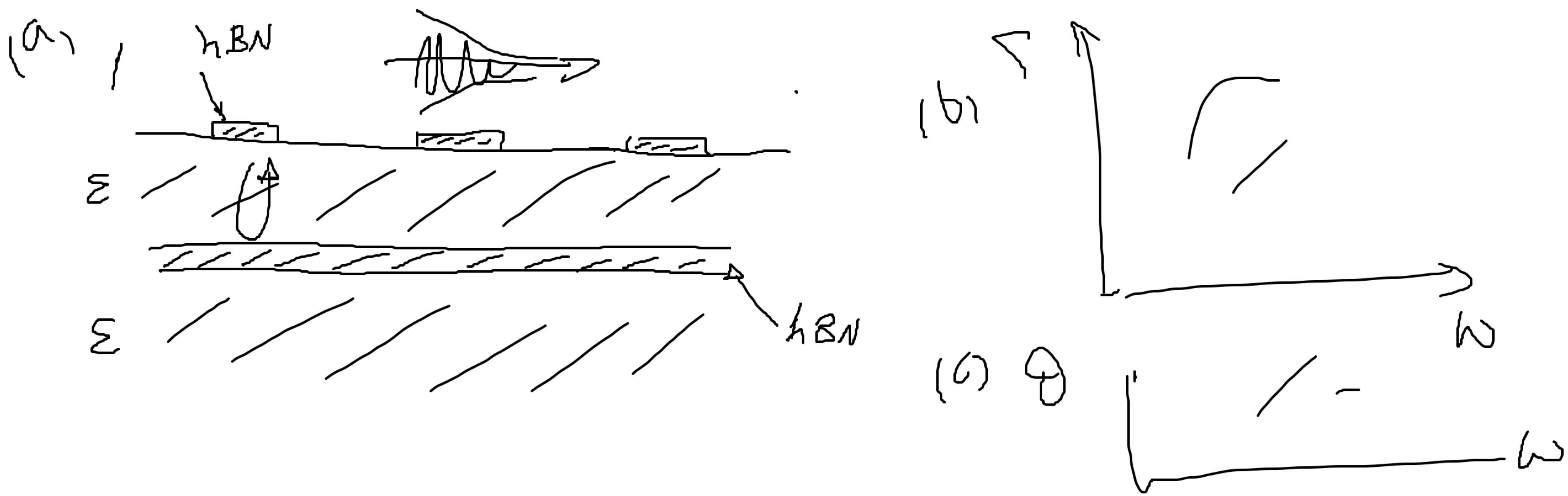
Fig. 2



SI → [$n = 2$, - - -

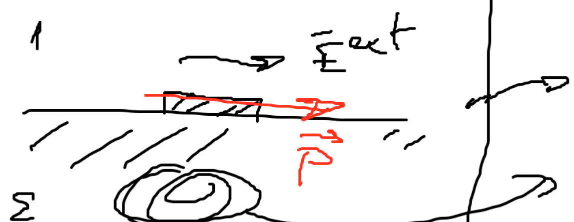
→ Sr, Ag, hBN]

FIG. 3



$\varepsilon = 1$

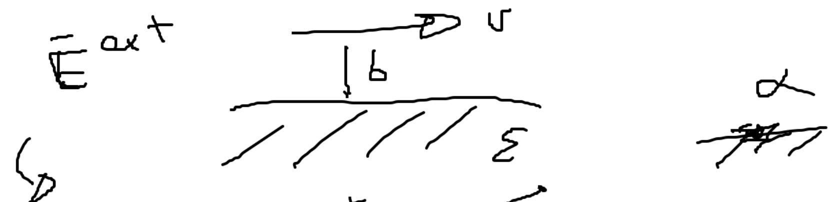
1



$$\phi = \frac{2}{1+\varepsilon}\,\frac{\bar{p}\cdot\bar{r}}{r^3}$$

$$\phi = \frac{2}{1+\varepsilon}\,\frac{Q}{r}$$

2



$$\bar{p} = \alpha\, E^{ext} + G_{\parallel}\,\vec{p}$$

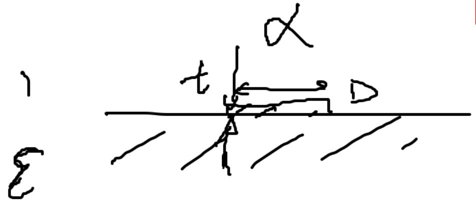
3

$\alpha \leftarrow$ PWF

$$\alpha \perp \frac{\varepsilon+1}{2}\, D^3 \,\frac{\xi_1^2}{1/\eta - 1/\eta_1}$$

$$\eta = \frac{i\sigma\, 2}{D\omega(\varepsilon+1)}$$

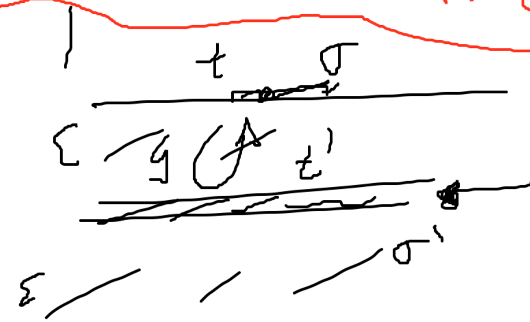
$\boxed{\bar{\rho} = \rho\,\hat{x}}$



(5) $\mathcal{G} = \int \frac{dQ}{(2\pi)^2} \frac{4\pi\, Q_x^2}{(\varepsilon+1)Q} \frac{e^{-2Qz_0}\, r'}{1 - r r' e^{-2Qz_0}}$

$\parallel$

$(\mathcal{G}_{xx})$



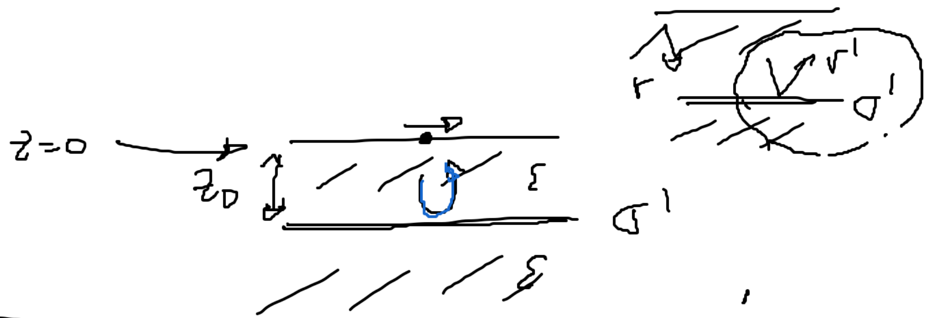
everything is $\parallel$

$E^{ind} = -\nabla\phi^{ind}$

$\to -iQ_x$

$\left(1 + \frac{4\pi i \sigma}{\omega t} = \varepsilon^{x,y}_{hBN}\right)$

$$\boxed{\alpha^{eff} = \frac{1}{\frac{1}{\alpha} - \mathcal{G}}}$$



at $z = z_0$!

$$\phi = \phi^{dip} + \phi^{ref}$$

(1)

$$\phi^{dip} = \frac{-2}{\varepsilon+1} (\bar{p}\cdot\nabla) \int \frac{d^2\bar{Q}}{(2\pi)^2} \frac{2\pi}{Q} e^{i\bar{Q}\cdot\bar{\rho}} e^{-Q|z|}$$

$\frac{1}{r}$

(2) in $\bar{Q}$ space $\quad \phi^{dip} = \frac{-4\pi i\, \bar{Q}\cdot\bar{p}}{(\varepsilon+1)Q} e^{-Q|z|}$

$$\phi^{ref} = + \frac{4\pi i\, \bar{Q}\cdot\bar{p}}{(\varepsilon+1)\,Q} \frac{e^{-2Qz_0}\, r'}{1 - r r' e^{-2Qz_0}}$$

(3)

(4) $\boxed{r' = \frac{1}{1 - i\omega\varepsilon/2\pi Q\sigma'}}$

$\boxed{r = \frac{1-\varepsilon}{1+\varepsilon}}$

$Q \equiv k_\parallel$