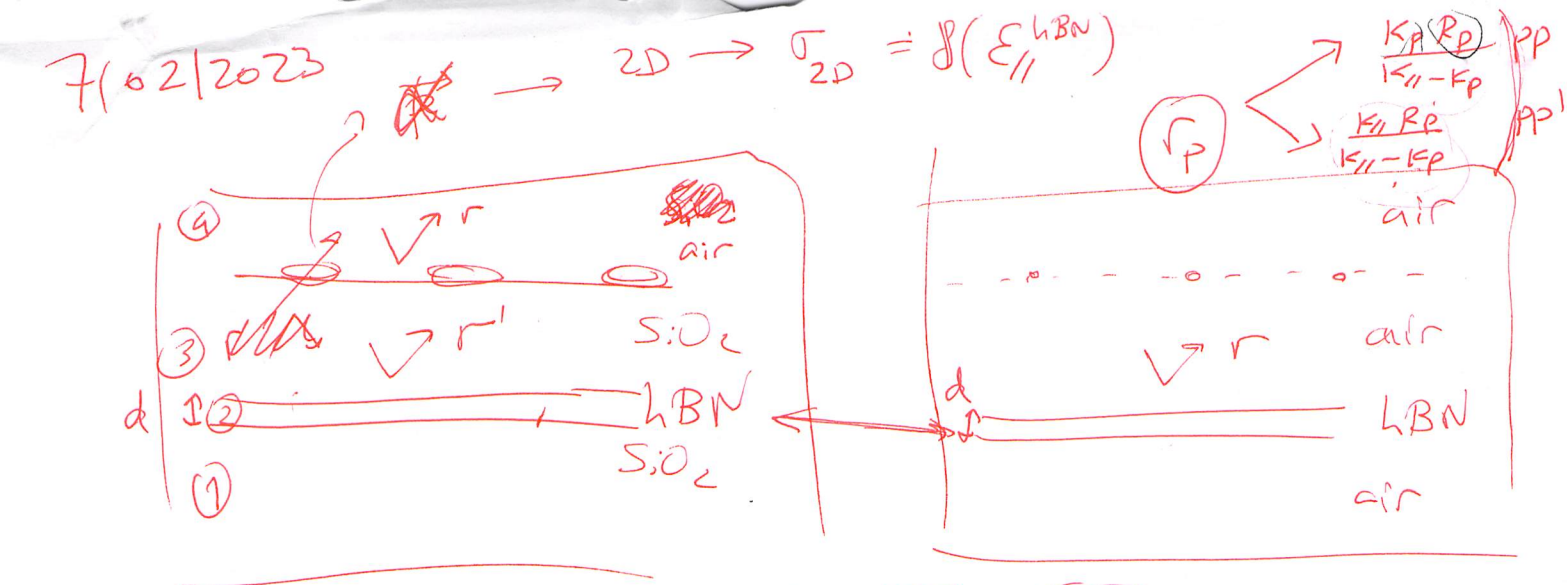
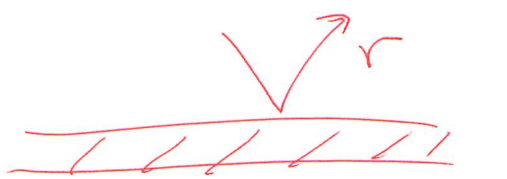
7/02/2023



$$r' = r^{32} + \frac{t^{32} r^{21} t^{23} e^{2ik_{z2}d}}{1 + r^{21} r^{23} e^{2ik_{z2}d}}$$

#370 r^{21}, r^{23} for hBN

$r = r^{34}$



$$r_p \approx \frac{K_p R_p}{K_{//} - K_p}$$

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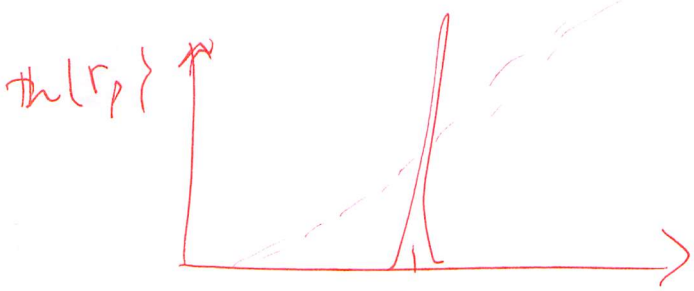


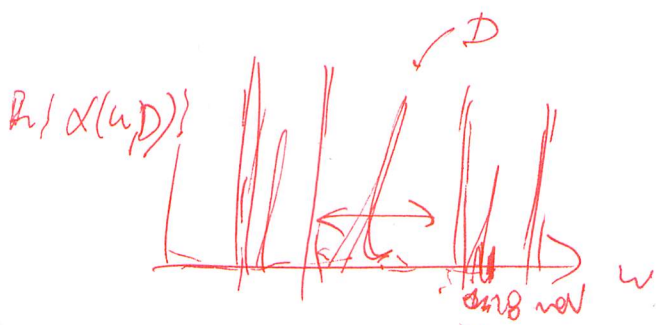
$$\int dK_{//}\, F(K_{//})\, r_p$$

$$\approx \int dK_{//}\, F(K_p)\, r_p$$

$w = \omega_p$

$\mathrm{Im}\{\alpha\} = \frac{3\varepsilon}{2k^3}$

$\alpha = i\,\mathrm{Im}\{\alpha\}$



$$G_{xx} = \frac{1}{2}\int_0^\infty dk_{\parallel}\; k_{\parallel}^2 \left(r_p(k_{\parallel})\right) e^{-2k_{\parallel} z_0}$$

PP ↓

$$= \boxed{\frac{1}{2} R_p k_p \int_0^\infty dk_{\parallel}\; \frac{k_{\parallel}^2}{k_{\parallel} - k_p}\, e^{-2k_{\parallel} z_0}}$$

$$k_p = k_p' + i k_p''$$

$$\simeq \frac{R_p k_p}{2}\; P.V. \int_0^\infty dk_{\parallel}\; \frac{k_{\parallel}^2}{k_{\parallel} - k_p'}\, e^{-2k_{\parallel} z_0} \; - i\pi \frac{R_p k_p}{2}\, k_p^2\, e^{-2k_p z_0}$$

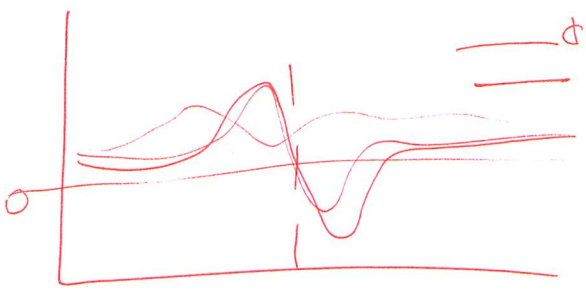
$$G(r_p) \xleftarrow{k_{\parallel}} G(r_p^{PP}) \longleftrightarrow G_{xx} \qquad \checkmark$$

$d = 0$ $\quad \mathrm{Re}\{G\}$

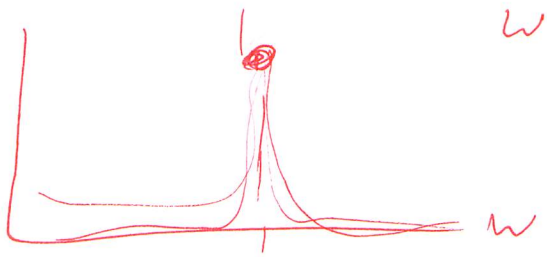
$d > 0$

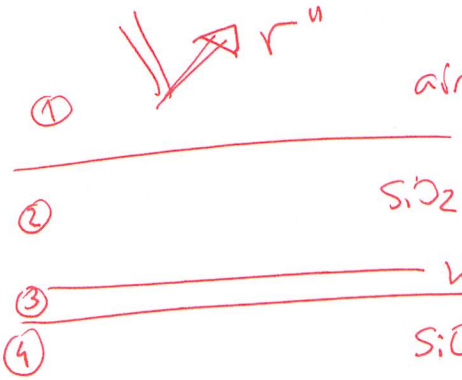
$$r_p \longrightarrow r_p^{PP}$$

$\mathrm{Re}\{\alpha\}$



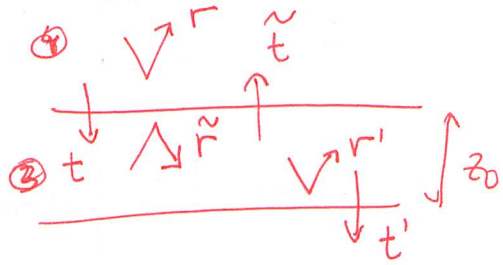
$\mathrm{Im}\{\alpha\}$



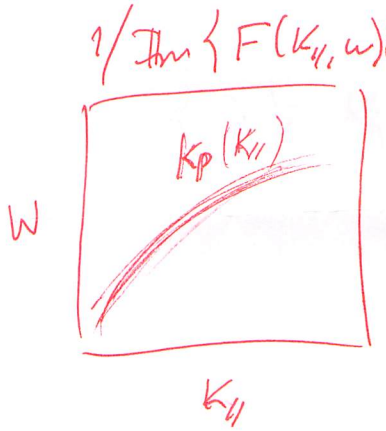


≡

$$r'' = r + \frac{t\, r' \tilde{t}\, e^{2ik_{z3}d}}{1 + r' \tilde{r}\, e^{2ik_{z3}d}}$$



Poles: $\underbrace{1 + r' \tilde{r}\, e^{2ik_{z3}d}}_{F(k_{\parallel}, \omega)} = 0 \quad \Longrightarrow$ PP. Approx.



→ If $\mathrm{Re}\{r_p\} \neq \mathrm{Re}\{PP\} = \mathrm{Re}\{PP'\}$

PP: ok for $d \to 0$.
PP can be used for Im.
Re must be calculated numerically

→ If not ...

Imk_{zj}