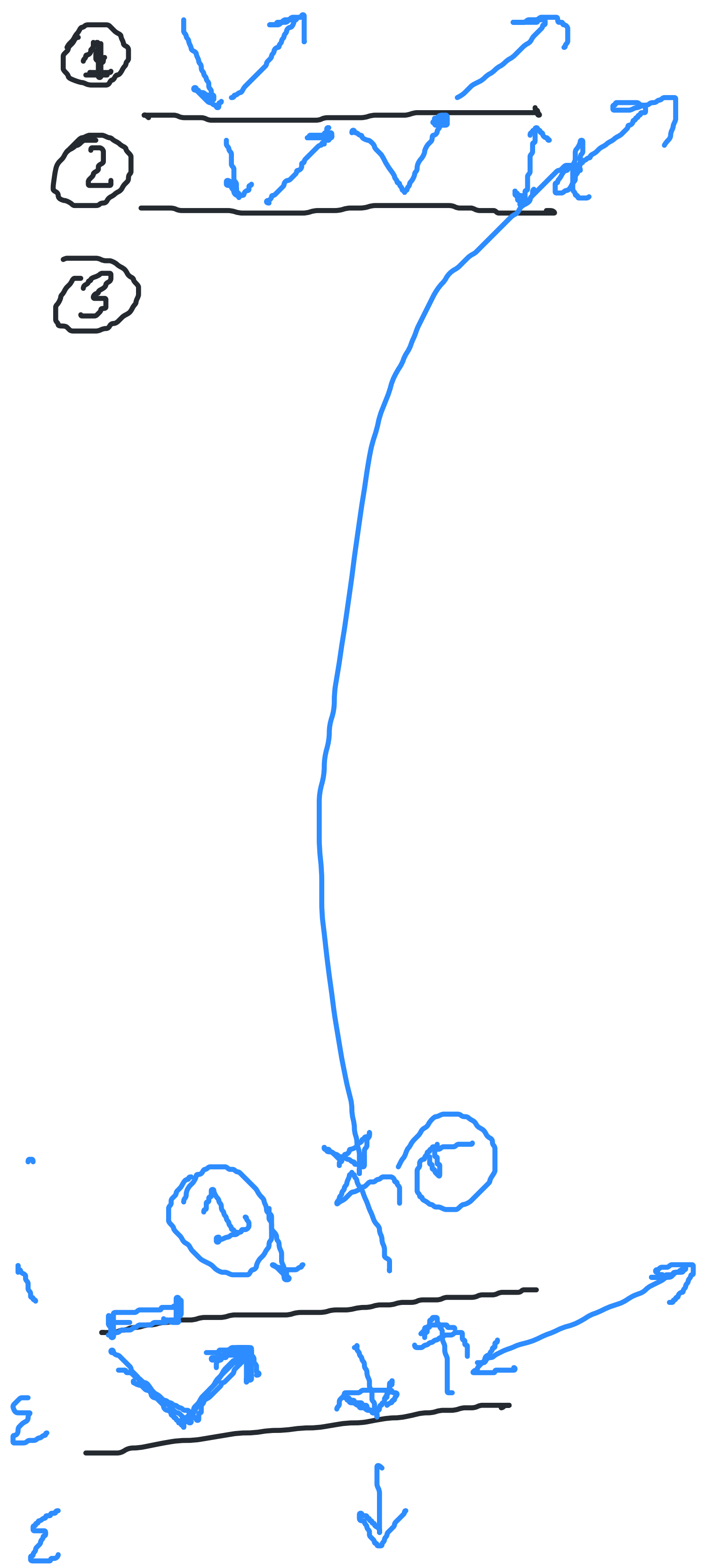
$\Delta = e^{ik_z d}$



$$\Gamma = r_0^{12} + t_0^{12}\Delta r_0^{23}\Delta\left[1 + r_0^{21}\Delta r_0^{23}\Delta + (r_0^{21}\Delta r_0^{23}\Delta)^2 + \dots\right] t_0^{21}$$

$$= r_0^{12} + t_0^{12}\Delta r_0^{23}\Delta t_0^{21} \underbrace{\sum_{n=0}^{\infty}(r_0^{21}\Delta r_0^{23}\Delta)^n}_{= \frac{1}{1 - r_0^{21} r_0^{23}\Delta^2}}$$

$$= r_0^{12} + \frac{t_0^{12} r_0^{23} t_0^{21}\Delta^2}{1 - r_0^{21} r_0^{23}\Delta^2}$$

$$\Gamma = \Delta r_0^{23}\Delta + \Delta r_0^{23}\Delta\overbrace{(r_0^{21}\Delta r_0^{23}\Delta)} + \dots$$

$$= \frac{r_0^{23}\Delta^2}{\underbrace{1 - r_0^{21} r_0^{23}\Delta^2}}$$

$\Delta^2 = e^{2ik_z d}$

$\approx e^{-2Qd}$

$k_z \to iQ$

$r_0^{21} = \frac{\varepsilon - 1}{\varepsilon + 1}$ $\quad r_0^{23} = \dots \sigma$