

We can write

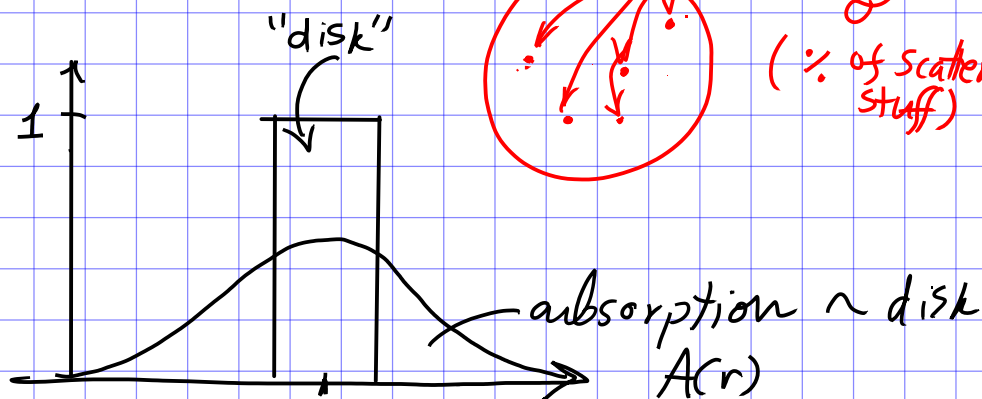
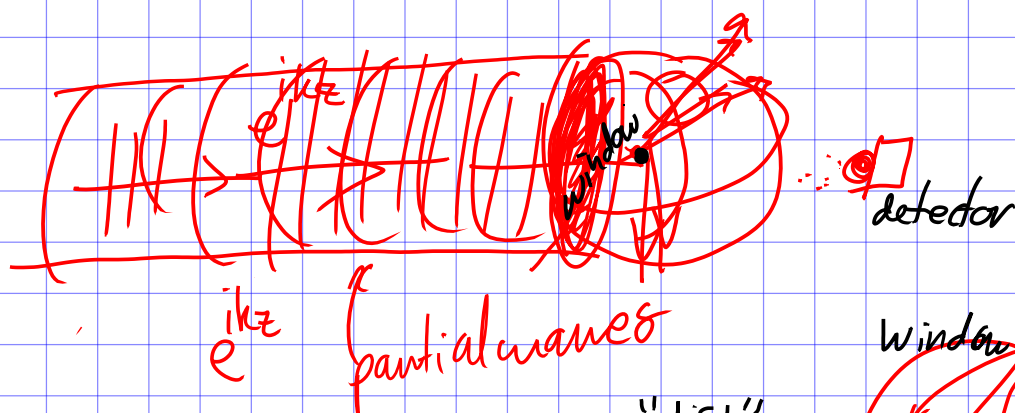
$$a_l = \frac{e^{i\delta_l} \sin \delta_l(k)}{k} = \frac{\sin \delta_l(k)}{k e^{-i\delta_l}}$$

$$= \frac{\sin \delta_l(k)}{k(\cos \delta_l - i \sin \delta_l)} = \frac{1}{k \frac{\cos \delta_l}{\sin \delta_l} - ik}$$

$$\therefore a_l = \frac{1}{k \cot(\delta_l) - ik}$$

we can write the scattering cross-section as:

$$\sigma = \sum_l \frac{4\pi(2l+1)}{k^2 + k^2 \cot^2 \delta_l(k)}$$



$$\sigma \sim \frac{1}{4\pi} \int A(r) dr^2 dz$$

