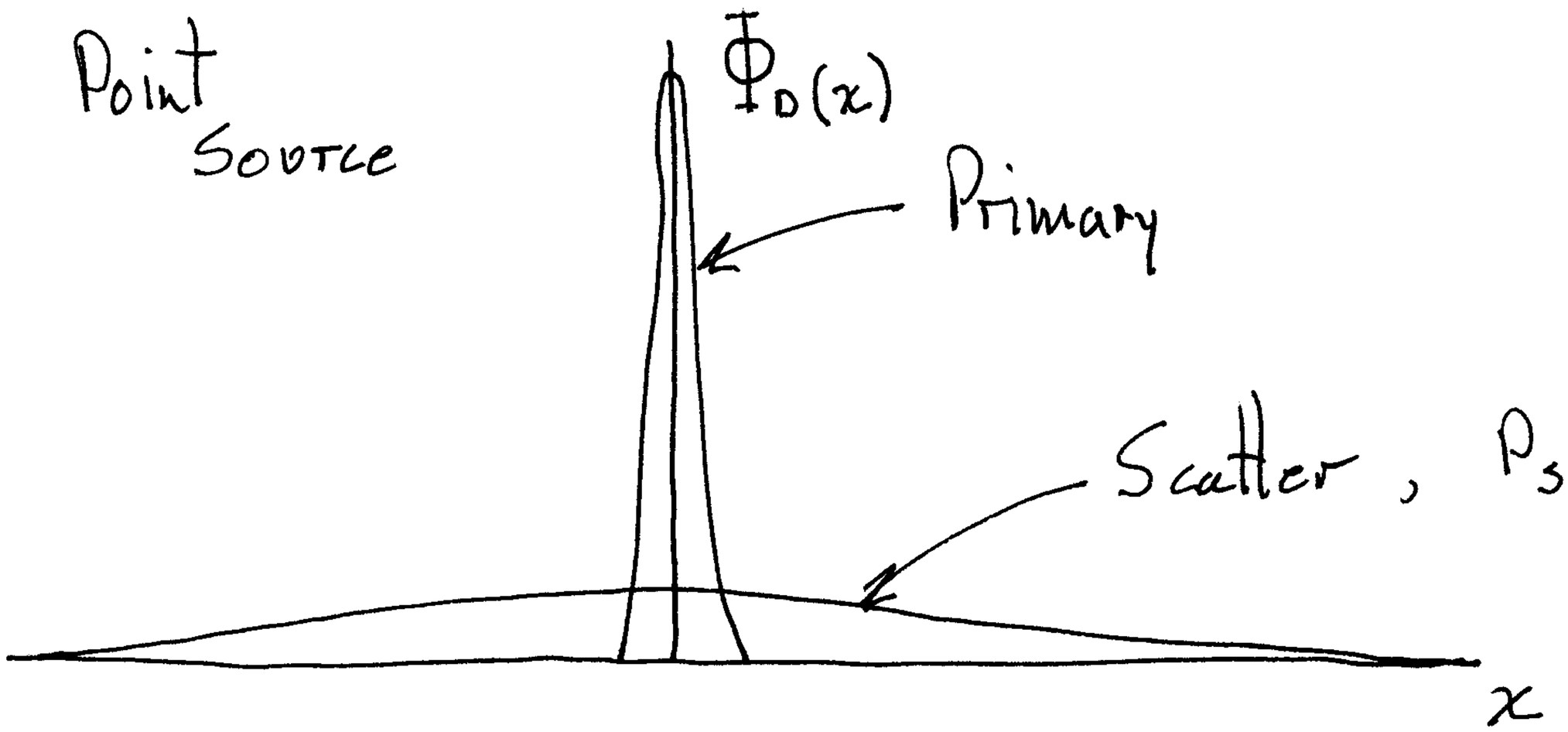
Scatter

Point Spread Functions



If Φ_p is the primary radiation as $P_s(\Delta x, \Delta y)$ is the scatter point spread function, then

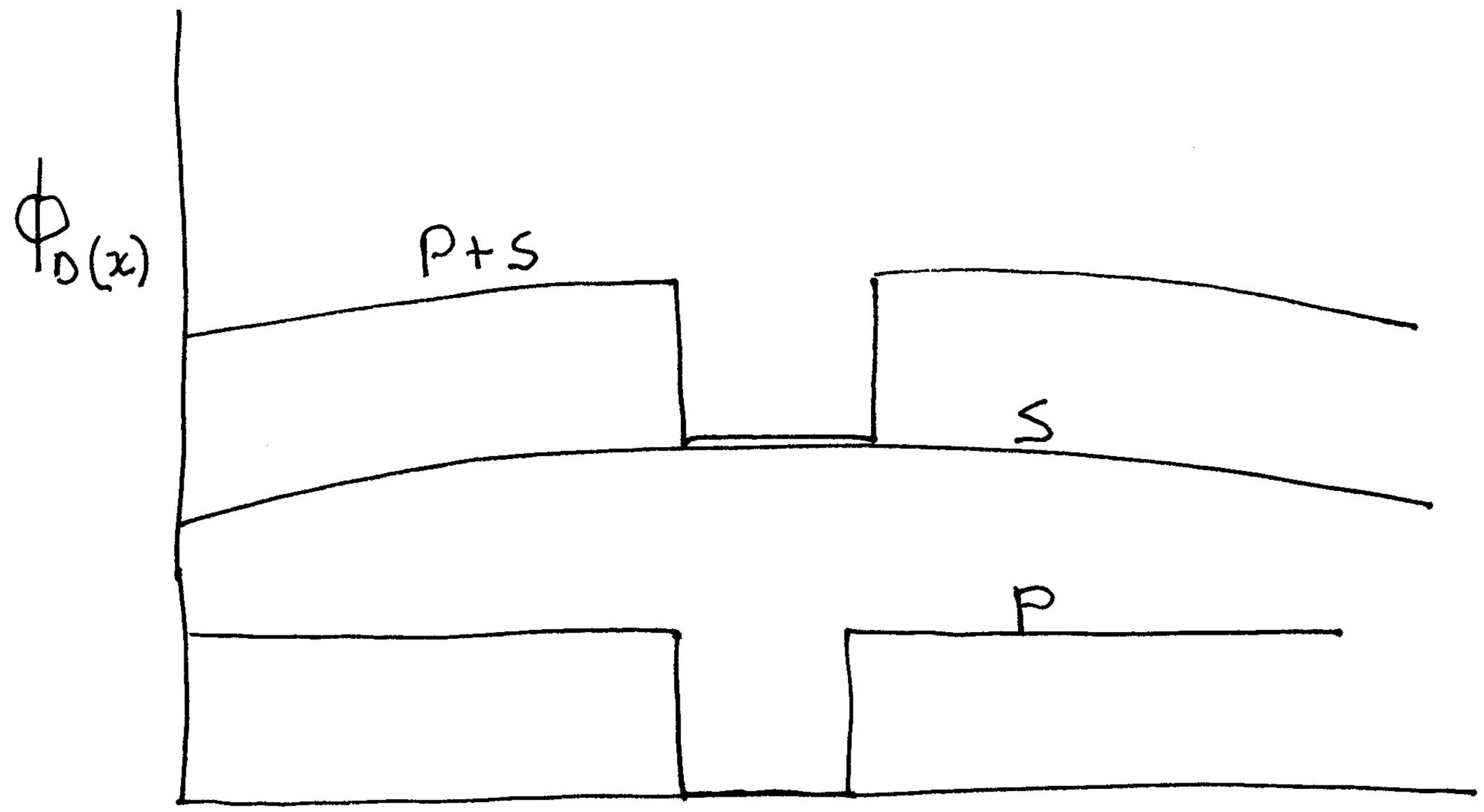
$$\Phi_{s(x,y)} = \iint P_s(x-x', y-y')\, \Phi_p(x', y')\, dx'dy'$$

or for a discrete detector

$$\Phi_{s(i,j)} = \sum_{i'}^{N_x} \sum_{j'}^{N_y} P_s(i-i', j-j')\, \Phi_p(i', j')$$

Scatter

Contrast Reduction

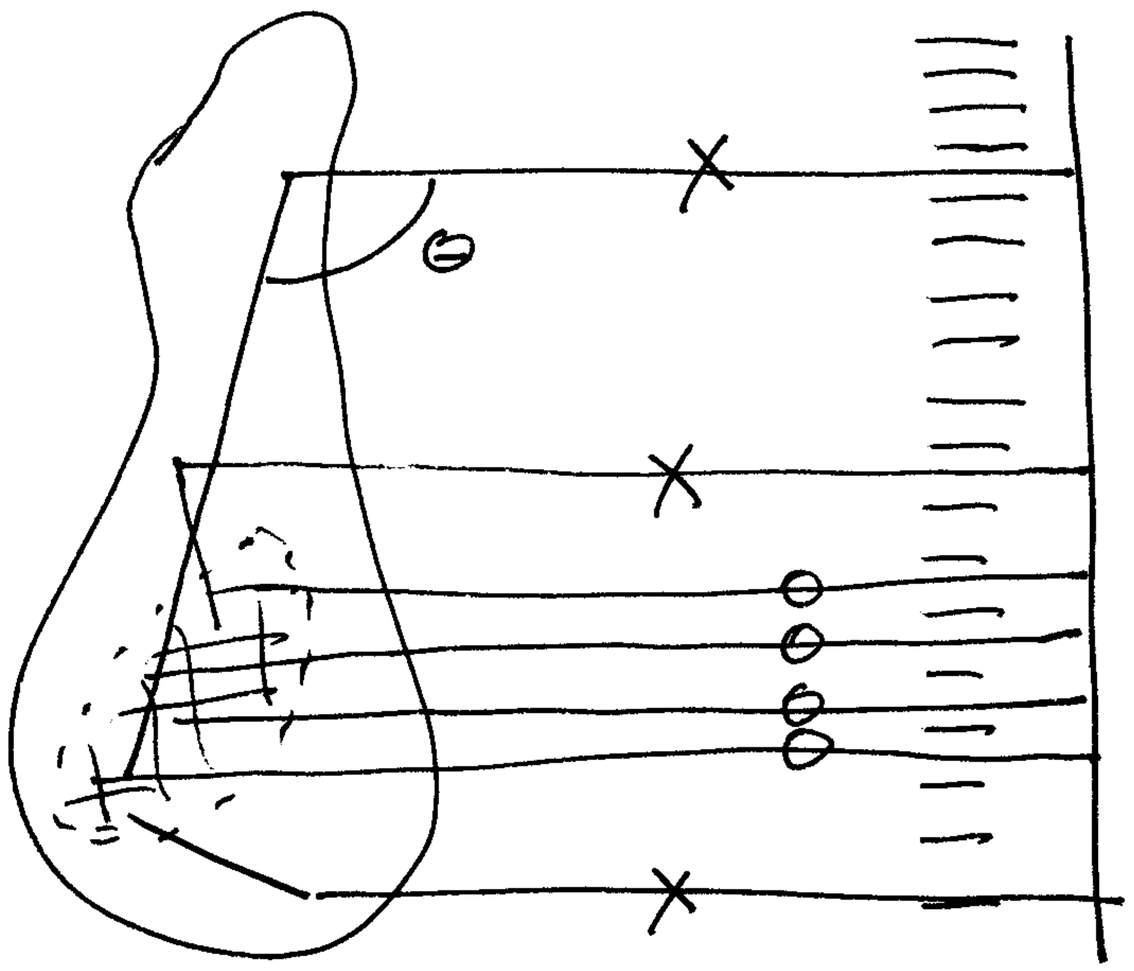


$$C_r = \frac{P}{P+S}$$

$$= \frac{1}{1 + S/P}$$

ScaHer

Emission Imaging



$$\frac{1}{E} - \frac{1}{E_0} = \frac{1}{511}(1-\cos\theta)$$

$$\frac{1}{E_0-\Delta E} - \frac{1}{E_0} = \frac{1}{511}(1-\cos\theta)$$

$$\frac{1}{1-\frac{\Delta E}{E_0}} - 1 = \frac{E_0}{511}(1-\cos\theta)$$

for $\Delta E \ll E_0$, low energy

$$\frac{\Delta E}{E_0} \simeq \frac{E_0}{511}(1-\cos\theta)$$

$$\frac{\Delta E_{max}}{E} \simeq \frac{E_0}{255}$$

Scatter

Emission Imaging