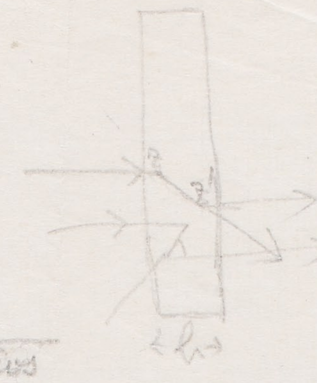
Scattering and Absorption of Slow Neutrons



$$\frac{1}{\lambda} = \frac{1}{\lambda_1} + \frac{1}{\lambda_2}$$

(i) $$\int_0^h e^{-\frac{z}{\lambda}} \frac{dz}{\lambda_2}\, dw = \frac{\lambda}{\lambda_2}\left(1 - e^{-\frac{h}{\lambda}}\right) dw$$

(ii) $$\int_0^{\pi/2}\int_0^h\int_z e^{-\frac{z}{\lambda}} \frac{dz}{\lambda_2} \times \frac{\sin\theta\, d\theta}{2} e^{-\frac{z'-z}{\lambda\cos\theta}} \frac{dz'}{\lambda_2\cos\theta}\, dw\, e^{-\frac{h-z'}{\lambda}}$$

$$+ \int_0^{\pi/2}\int_0^h\int_0^z e^{-\frac{z}{\lambda}} \frac{dz}{\lambda_2} \frac{\sin\theta\, d\theta}{2} e^{-\frac{z-z'}{\lambda\cos\theta}} \frac{dz'}{\lambda_2\cos\theta}\, dw\, e^{-\frac{h-z'}{\lambda}}$$

$$= dw \int_0^1 \frac{dx}{2\lambda_2^2 x} \int_0^h e^{-\frac{(h+z)}{\lambda}} dz \int_z e^{-\left(\frac{1}{\lambda x} + \frac{1}{\lambda}\right)z'} dz'$$

$$+ dw \int_0^1 \frac{dx}{2\lambda_2^2 x} \int_0^h e^{-\frac{(h+z)}{\lambda}} dz \int_0^z e^{-\left(\frac{1}{\lambda x} - \frac{1}{\lambda}\right)z'} dz'$$

$$= dw \left[\int_0^1 \frac{dx}{2\lambda_2^2 x}\left[\int_0^h e^{-\frac{h}{\lambda}} \cdot e^{-\frac{z}{\lambda}\left(1+\frac{1}{x}\right)} \frac{e^{\left(\frac{1}{\lambda x}+\frac{1}{\lambda}\right)z} - 1}{\left(\frac{1}{\lambda x} + \frac{1}{\lambda}\right)} dz\right.\right.$$

$$+ \int_0^h e^{-\frac{h}{\lambda}} e^{-\frac{z}{\lambda}\left(\frac{1}{x}-1\right)} \frac{e^{\left(\frac{1}{\lambda x}-\frac{1}{\lambda}\right)h} - e^{\left(\frac{1}{\lambda x}-\frac{1}{\lambda}\right)z}}{\left(\frac{1}{\lambda x} - \frac{1}{\lambda}\right)}\Bigg]\lambda\left\{1 - e^{-\frac{h}{\lambda}\left(\frac{1}{x}+1\right)}\right\}$$

$$= dw\left[\lambda \int_0^1 \frac{dx\, e^{-\frac{h}{\lambda}}}{2\lambda_2^2 x} \cdot \left\{\frac{1}{\left(\frac{1}{x}+1\right)}\left\{h - \frac{\lambda\left(e^{-\frac{h}{\lambda}\left(\frac{1}{x}+1\right)} - 1\right)}{\left(\frac{1}{x}+1\right)}\right\}\right.\right.$$

$$\left.+ \frac{1}{\frac{1}{x}-1}\left\{\frac{\lambda\left(e^{-\frac{h}{\lambda}\left(\frac{1}{x}-1\right)} - 1\right)}{\frac{1}{x}-1} - h\right\}\right]$$

$$\frac{\lambda e^{-\frac{h}{x}}}{2\lambda^2} dw \left[\int_0^1 \frac{dx}{dx} \left[\frac{1}{x+1} \left\{ h - \frac{\lambda\left(1-e^{-\frac{h}{x}\left(\frac{1}{x}+1\right)}\right)}{\left(\frac{1}{x}+1\right)} \right\} \right. \right.$$

$$+ \frac{1}{1-x} \left\{ \frac{\lambda\left(e^{-\frac{h}{x}\left(\frac{1}{x}-1\right)}-1\right)}{\frac{1}{x}-1} - h \right\}$$

$$e^{\frac{h}{x}} \left(1 + e^{\frac{h}{2\lambda}} e \right.$$

$$e^{-\frac{h}{x}} \left(1 + e^{\frac{h}{x}} \right)$$

$\lambda < \lambda'$

$$e^{-\mu x} + \alpha x e^{-\mu' x}$$

μ

$$e^{-\frac{h}{x}} \left(1 + \frac{h}{x} \frac{\Omega}{4\pi} \right)$$

$$e^{-\mu x} \left(1 + n_0 \sigma_0 x \frac{\Omega}{4\pi} \right)$$

$+ n_{cu} \sigma_{cu}^{(s)}$

$e^{-\mu x} +$

$$\mu = n_{cu} \left(\sigma_{cu}^{(c)} + \sigma_{cu}^{(s)} \right) + n_0 \sigma_0$$

~~will~~ is a little interesting, though
it ~~may~~ not be altogether meaningless
to deal with
not ~~be~~ very useful,

$\cos\theta_c = \frac{h}{\tau_c}$

10×20 K.N.K.

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