velocities of the fast neutrons present in a cubic centimeter. The pile equations then are

$$\Delta n_t - \varkappa_t^2 n_t + \varkappa_t^2 a n_f = 0 \qquad (11a)$$

$$\Delta n_f - \varkappa_f^2 n_f + \varkappa_f^2 (k/a) n_t = 0 \qquad (11b)$$

These equations already were used in the above mentioned C-83 by Ibser and Wheeler. In it, $\varkappa_t$ is the reciprocal diffusion length of thermal neutrons in the pile (that takes into account the presence of the metal), $\varkappa_f^2$ is the reciprocal age, k is the multiplication constant, and

$$a = p_1 \sigma_{af}/\sigma_{at} \qquad (11c)$$

Herein σ_{at} is the absorption cross section for thermal neutrons per cubic centimeter, p_1 is the probability for a neutron to escape resonance absorption, and

$$\sigma_{af} = \frac{\sigma_f \xi}{\ln(E_f/E_t)} \quad . \qquad (11d)$$

Herein again σ_f is the total cross section for a fast neutron per cubic centimeter, ξ is the average logarithmic energy loss of a neutron upon collision with an atom of the moderator, E_f and E_t are the energies of fission and thermal neutrons respectively.

The above notation holds for $x < 0$, i.e., on the left side of the boundary. On the right side of the boundary a similar notation will be used from equation (16) on, except that every small letter will be replaced by a capital.

On the left side of the pile the neutron densities are linear combinations of the four expressions

$$e^{\varkappa_1 x} \,,\quad e^{-\varkappa_1 x} \,;\qquad e^{\varkappa_2 x} \,,\quad e^{-\varkappa_2 x} \quad . \qquad (12)$$

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