Macroscopic cross section

The macroscopic cross section is the microscopic cross section times the atomic density of the material.

Σ is the probability for a reaction to occur per distance travelled by a neutron.

$$\Sigma = \sigma \cdot N$$

σ is microscopic x-section $\left(\text{cm}^2\right)$

N is atomic density $\left(\text{cm}^{-3}\right)$

σ depends on $\left(E\right)$, N on $\left(\vec{r}, t\right)$