

Level density parameter

In the GRAZING model the nucleon level density in the vicinity of the Fermi level is approximated as follows

$$g^n = \frac{3N}{2\varepsilon^n} \frac{15}{\delta^n}, \quad g^p = \frac{3Z}{2\varepsilon^p} \frac{15}{\delta^p},$$

where the Fermi energies for neutrons ε^n and protons ε^p read (in MeV)

$$\varepsilon^n = 52 - 22 \frac{N - Z}{A} - 8,$$

$$\varepsilon^p = 52 + 22 \frac{N - Z}{A} - \frac{Ze^2}{1.2A^{1/3}} - 8,$$

correspondingly. In the formulas above A is the nucleus mass number, Z is the nucleus charge and $N = A - Z$ is the neutron number. The adjustable parameters $\delta^{p,n}$ equal to 8 by default.

See [1,2] for details.

References:

- [1] A. Winther, Grazing reactions in collisions between heavy nuclei, *Nuclear Physics* **A572** (1994) pp. 191 – 235.
- [2] A. Winther, Dissipation, polarization and fluctuation in grazing heavy-ion collisions and the boundary to the chaotic regime, *Nuclear Physics* **A594** (1995) pp.203 – 245.