Carl Friedrich von Weizsäcker – 1935

Expression of G. Gamow's liquid-drop model:

Neuromorphic improvement of the Weizsaecker formula

Mihai-Octavian Dima

$$E_{
m B} = a_{
m V} A - a_{
m S} A^{2/3} - a_{
m C} rac{Z(Z-1)}{A^{1/3}} - a_{
m A} rac{(N-Z)^2}{A} + \delta(N,Z)$$

Phenomenological "nuclear-medium" formula:

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Weizsaecker vanilla 160

- volume term (nuclear force saturation)

- surface term (also saturation)

- Coulomb term term (electrostatics)



Polynomial improvement of the residual is possible only in the:

- low mass region, Z < 20 (known for its quantum effect domination)
- high-error regions

First attempt at problem. Modest gains. Shows the deeply non-linear nature of the residual (quantum).

Need advanced improvements:

- non-polynomial (quantum, J^{π})

- magic-numbers (exogenous)

(exogenous)





- stability line

