International Journal of Advanced Research in Physical Science (IJARPS)
Volume 11, Issue 11, 2024, PP 6-7
ISSN (Online)-2349-7882
www.arcjournals.org

Dimensionality Change in Uranium

Janez Špringer*

Cankarjeva cesta 2, 9250 Gornja Radgona, Slovenia, EU

Corresponding Author:** ***Janez Špringer, *Cankarjeva cesta 2, 9250 Gornja Radgona, Slovenia, EU*

Abstract: *The space-time dimensionality change in uranium was presented.*

Keywords: *mass, energy, nuclear fission, space-time dimensionality, neutrons, protons, uranium*

1. Introduction

[1] Following the double surface concept there are available ten plausible dimensional states. Taking into account coincidental results from gamma radiation we can suggest that particles in nucleus can occupy one spatial dimension which inseparable with one direction of time forms 1.5- space-time. Taking into account coincidental results from hot fusion and cold fusion we can further suggest that particles in nucleus can occupy also three spatial dimensions in 3.5- space-time. Essential characteristics of both dimensional states including interesting implausible ones are collected in Table1:

Table1. *Essential characteristics of 1.5- and 3.5- space-time dimensional states [1]*

Dimensionality R $R = 2\sqrt{1+\frac{\pi^2}{n^2}-1}$	Elliptic length *n* (in $\lambda_{Compton}$) $n = \frac{\pi}{\sqrt{\left(\frac{R+1}{2}\right)^2-1}}$	Average elliptic-hyperbolic length *s(n)* (in $\lambda_{Compton}$) $s(n) = n\left(2-\frac{1}{\sqrt{1+\frac{\pi^2}{n^2}}}\right)$	Fraction by the matter occupied length (inversed length $\frac{1}{s(n)}$)	Dimensionality characteristic
1.5	4.188 790 204 8	5.026 548 245 7	0.198 943 678 9	plausible
1.506 311 788	4.159 682 955 2	5	0.2	implausible
3.5	1.558 666 443 9	2.424 592 460 7	0.412 440 447 7	plausible
4.519 985 968	1.221 239 624 9	2	0.5	implausible

2. Transformation from 3.5- to 1.5- Dimensional State

Transformation of matter from 3.5- to 1.5- dimensional state turns the mass difference of both states to energy. The event is recognized by the energy difference of (0.1989436789 – 0.4124404477 = 0,2134967688) mc^2 which in the case of proton with m_pc^2 = 938.272 MeV amounts to 200.318 MeV as follows:

$$\Delta E_{proton}^{3.5\rightarrow 1.5} = (0.412\ 440\ 447\ 7 - 0.198\ 943\ 678\ 9)\ .938272\ keV = 200.318MeV. \quad (1)$$

3. Coincidence with Nuclear Fission of Uranium

The released energy due to 3.5- to 1.5- dimensionality reduction at one proton (1) coincides with the energy of nuclear fission of uranium where about 200 MeV of energy is released per uranium atom U^{235}, largely in the form of kinetic energy of the two fission fragments (krypton Kr^{92} and barium Ba^{141}) and two to three neutrons *n* as follows [2]:

$$n + U^{235} \rightarrow Kr^{92} + Ba^{141} + 3n + about\ 200MeV. \quad (2)$$

What could mean that in the present nuclear fission one proton per nucleus should be transformed from 3.5- to 1.5- dimensional state to release such amount of energy per atom.

4. Conclusion

Merry Christmas and plenty, but not too much energy, in the New Year 2025

DEDICATION

To Reasonableness (Razumnosti)

REFERENCES

[1] Janez Špringer. "Plausible and Implausible Dimensionality" International Journal of Advanced Research in Physical Science (IJARPS), vol 11, no. 11, pp. 3-5, 2024.

[2] https://www.nek.si/en/about-nuclear-power/uranium-and-nuclear-fission. Retrieved November 2024

[3] Veeser, L. R. et al. "Neutrons produced by 740-MeV protons on uranium." *Nuclear Instruments and Methods* 117 (1974): 509-512.

ADDENDUM

Transformation from 1.5- to 10.5- Dimensional State

Let's also calculate the needed energy for transforming the 1.5- to 10.5- dimensional state applying the essential characteristics of both dimensional states presented in Table2:

Table2. *Essential characteristics of 1.5- and 10.5- space-time dimensional states [1]*

Dimensionality R $R = 2\sqrt{1+\frac{\pi^2}{n^2}-1}$	Elliptic length *n* (in $\lambda_{Compton}$) $n = \frac{\pi}{\sqrt{\left(\frac{R+1}{2}\right)^2-1}}$	Average elliptic-hyperbolic length *s(n)* (in $\lambda_{Compton}$) $s(n) = n\left(2-\frac{1}{\sqrt{1+\frac{\pi^2}{n^2}}}\right)$	Fraction by the matter occupied length (inversed length $\frac{1}{s(n)}$)	Dimensionality characteristic
1.5	4.188 790 204 8	5.026 548 245 7	0.198 943 678 9	plausible
1.506 311 788	4.159 682 955 2	5	0.2	implausible
10.5	0.554 818 816 3	1.013 147 403 7	0.987 023 207 4	plausible
10.661 565 554	0.546 897 427 7	1	1	implausible

The transformation of matter from 1.5- to 10.5- dimensional state turns the energy to the mass difference of both states. The event is recognized by the energy difference of (0.1989436789 –0.9870232074 = –0,7880795285) mc^2 which in the case of proton with m_pc^2 = 938.272 MeV amounts to –739.433 MeV as follows:

$$\Delta E_{proton}^{1.5\rightarrow 10.5} = (0.198\ 943\ 678\ 9 - 0.987\ 023\ 207\ 4)\ .938272\ keV = -739.433\ MeV. \quad (a)$$

If for instance protons with such energy of 740-MeV strike a thick uranium target about 25 neutrons are produced per proton. This means that maximal dimensionality of some proton in uranium is not comfortable for the whole atom so it results in the loss of neutrons. [3]

Citation: *Janez Špringer. " Dimensionality Change in Uranium" International Journal of Advanced Research in Physical Science (IJARPS), vol 11, no. 11, pp. 6-7, 2024.*