Proton and Neutron as 3D Construction

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Abstract — In this paper, there will be shown in construction how the virtual particles, the 3 quarks, build up with 3 gluons the Neutron and the Proton, the basic particles (together with the electrons) of the atoms. It is known that the whole matter consists of the 3 in confinement closed quark particles, for the Neutron as Down, down & up and for the Proton as Up, up & down, enhanced and reinforced with 3 gluon particles. The exact position of the 6 quarks and 8 gluons Elementary particles can be shown only constructively, as the constructions of Gell-Mann and Weinberg were removed in 1960 and 1967 by Quantum Mechanics and replaced by the laborious Lagrange mathematic formulas, therefore accessible only to a few experts. But here the nonmathematicians can see in a System of maximal probability the stationary order of Elementary particles.

Keywords — Neutron Structure, Proton Structure, Up, Down, QCD Quarks, 8 Gluons, 3D Construction.

I. INTRODUCTION

If the quarks have been found only with the strangeness and the half spin kaons, then the constructions with the smallest numbered particles (1/2, 1/3, 2/3) should also be accepted by Particle Physics and not only mathematics tolerated, especially by nonmathematicians. Additionally, the relationship 2/3 and 1/3 clearly means virtual gravity triangle points. Therefore the 6 Quarks of the Standard Model are only virtual points of 6 triangles occupying the whole place, meaning more than 3 generations are impossible. The construction orders of the particles of the unstable Neutron and the stable Proton should be the same as in the Higgs field; therefore, the internal distribution of the 6 particles can be done with the same Data & the same order as there with meaning that the System of the Particles can be coupled smoothly with the periodic table of elements and even the molecules of each type of matter.

II. CONSTRUCTION OF THE NEUTRON

For the sake of brevity, the Neutron consists of 1 up & 2 down quarks, but Pauli demands 2 different Down quarks; and the confinement even 3 colors: red, green, and blue.; therefore, more precisely:

1) Down, (-1/2, -1/3, -1/3),
2) down or Counter Down with inverted Spin (= because of Pauli not the same as -Down, but diagonal on the same plane through the circle line) (2/3, 1/3, -1/3), meaning (2/3 Spin = ½ +1/6).
3) The up3 (=Quantum Chromo Dynamic) = (-1/12, 0, 2/3) as center of the 2/3e Quark plane.
4) Gluon 1 = (0.83205.., 0.5547.., 0) to Down for the 1. Generation as in the DOI.
5) Gluon 2 = (-0.83205.., -0.5547.., 0) «Counter Down».
6) Gluon 7 = (1, 0, 0) «up3 on Spin.

A first handicap lies in the different circle centers of the upper (2/3e) & the lower (-1/3) circle plane. But therefore, the symmetry is broken, and the best beginning opportunity is the normal case: red Spin crosses green Strangeness and in the center lies the perpendicular blue Charge, all 3 axes from -1 to +1. I found the GeoGebra program all right for good precision and easy replication of all 3 representations: vertical, horizontal, and frontal or lateral.

The construction can be done step by step as in the protocol. The Data are all from the Higgs field, resp. from Gell-Mann’s 3D construction for Up, Down and Strange and Weinberg’s 2D-Standard Model [6] construction with 61 Elementary particles, constructed with the demands of geometry, Pauli, QCD, Dirac, and known weight.

The instability of the Neutron is caused by only small equatorial 1 spin gluons (Fig. 1); the upper QCD quark and the lower Down-counter Down quarks are open without protection by the gluons (Fig. 2 and 3). Therefore, 3 Gluons are enough (Gluon 1 and 2 for the first generation and Gluon 7 for the QCD up3). The
instability will be greater at higher temperatures (Chain reaction of nuclear energy!) contrary to the stable Proton.

The construction protocol results right in Fig. 1 that the charge of the half spin Neutron lies below and up in the center of a 2/3 circle between -1/12 & +1/12 = 0.

Fig. 1 shows that there may be lie 3 to 6 Gluons on the 2 spin diameter of a sphere, but only equatorial; the upper and lower quarks lie open. The charge of the Neutron lies below and up in the center of a 2/3 circle between -1/12 and +1/12 = 0.

Fig. 1. The gluons with Spin1 and construction protocol.

Fig. 2. Gluon 2 in front and Gluon 1 behind.

Fig. 3. Symmetrical view.

III. CONSTRUCTION OF THE PROTON

Again, for the sake of brevity the Proton consists of 2 up & 1 down, but more precisely.

1. UP = (1/2, 1/3, 2/3).
2. up or CounterUp = with inversed Spin (= because of Pauli not the same as -Up, but on the same plane on the circle line) (-2/3, -1/3, 2/3) (-2/3 Spin = -½ -1/6).
3. the down3 (Quantum Chromo Dynamic) = (1/12, 0, -1/3) as center of the -1/3e Quark plane.
4. Gluon 1 = (0.83205..., 0.5547..., 0) to Down for the 1. Generation as in the DOI.
5. Gluon 2 = (-0.83205..., -0.5547..., 0) « Counter Down «.
6. Gluon 8 = (-1, 0, 0) « down3 QCD on Spin.

Again, the results are given on the Construction protocol: Contrary to the Neutron construction, the sphere center is the same center as on the connection of the Up to the counter Up stretch; the Neutronic center is only between – 1/12 and +1/12.

Remark on the construction: the 4/3 upper plane points resulted without crossing lines!

Analogous to Dirac: the 4/3 upper plane is the counter plane of -1/3 plane if the center point equals the Higgs center.

Therefore, the more energy (temperature), the more stable with all 8 Gluons is possible [3].
Fig. 4. general view of required sphere diameter 2e and parts of the protocol.

Remark on the construction: the 4/3 upper plane points resulted without crossing lines! Therefore, the more energy (temperature), the more stable with all 8 Gluons is possible. The horizontal position shows in the protocol a full 1/3 e circle of the QCD down quark (Fig. 5). The QCD down Quark causes the skew to the 2/3 Up – CounterUp circle (Fig. 6).

Fig. 5. Proton sphere in horizontal position.

The horizontal view in Fig. 7 shows the stable Proton with 2/3 w2 as the sphere center, the neutral Zero circle plain with the Gluons symmetrical with the 4/3 e counter Gluon plane.

Before the Proton decays to a Pion as in Fig. 8, at 5/3 e the QCD AntiDown is forming symmetrical to -1/3 e.

Fig. 6. Proton sphere lateral with 2 skew circle4.
In Fig. 4, the proton shows a broken symmetry and has a positive Charge of \((4/3 - 1/3) = 1\). The Volume is 44% greater than the Neutron because the Bosonic Gluons lie deeper than the sphere diameter.

Fig. 5 shows the broken Symmetry of the 4/3 circle with the -1/3 circle. Fig. 6 shows the best position for the charge \((4/3 - 1/3 = 1)\). The stability of the Proton lies identically with Anti Muon on a stable position circle.

The stability of the Proton (same Higgs field place as Anti Muon) lies on the same center w2 as the 2/3 up positive quarks in the middle of 4 possible protecting connections [5] between the Zero neutral and 4/3 e counter symmetrical gluon planes.

The Protons are the most stable + particles of the atomic nuclei determining the Elements by their quantity. For simplicity, the Proton consists of 2 up- & 1 down-quarks, but the exact should be 1 Up \((1/2, 1/3, 2/3)\), the Pauli counter-up quark \((-2/3, -1/3, 2/3)\), and the QCD-down quark \((-1/12, 0, -1/3)\) as well until 5 more symmetrical, neutral Gluons for the strong nuclear force & weight.

Result of the Proton: \(4/3 - 1/3 = +1\ e\); with 3 to 8 Gluons, more Gluons are more stable.

IV. CONCLUSION

The Proton construction supports Ethan Siegel's results (more Gluons at a higher temperature). Until now the Gluons were never shown as particles, only as spiral “strong Bosonic forces” in contrary to the Standard Model with the 17 “Fundamental Particles”, where they are Bosonic particles with Spin 1. The Quarks with Spin 1/2 other side are only virtual particles because they are triangular gravity points. As long as Particles can be shown in a System, they are timeless and therefore waves and Quantum independently

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as e.g., the periodic System of elements or even the Higgs field with 61 Elementary Particles. Of course, the temperature fluctuations are always shown with the whole spheres. The constructions can be used to determine the Volume: The Proton is constructively 44% greater than the Neutron. The mass determines the Higgs Boson. The constructions are especially useful for the majority of non-mathematicians; the few experts should use the Lagrange mathematical formulas, but then Heisenberg’s uncertainty stands before each result.

**APPENDIX**

**PROTON PROTOCOL 3D CONSTRUCTION**

| Nr. | Name               | Beschreibung                                                   | Wert                      |
|-----|--------------------|---------------------------------------------------------------|---------------------------|
| 1   | Text Text2         | "Proton as 3 D-Construction"                                  |                           |
| 2   | Punkt T            | $T = (0, 0, 1.5)$                                              |                           |
| 3   | Punkt center       | Schnittpunkt von $x$-Achse, $z$-Achse center $= (0, 0, 0)$    |                           |
| 4   | Strecke i          | Strecke $T$, center $i = 1.5$                                 |                           |
| 5   | Punkt W1           | $W1 = (0, 0, 0.66667)$                                        |                           |
| 6   | Punkt Down3        | $\text{Down3} = (0.08333, 0, -0.33333)$                       |                           |
| 7   | Punkt W3           | $W3 = (0, 0.33333, 0)$                                        |                           |
| 8   | Punkt W2           | $W2 = (0, 0, 0.33333)$                                        |                           |
| 9   | Kreis s            | Kreis durch $W2$, $W3$, $\text{Down3}$ $s$: $X = (0.04167, 0, 0) + (0.05848 \sin(t), 0.23754 \cos(t) - 0.23391 \sin(t), -0.23754 \cos(t) - 0.23391 \sin(t))$ |                           |
| 10  | Punkt Up           | $\text{Up} = (0, 0.33333, 0.66667)$                           |                           |
| 11  | Punkt Counterup    | $\text{Counterup} = (-0.66667, -0.33333, 0.66667)$            |                           |
| 12  | Strecke $f_1$      | Strecke Counterup, Up $f_1 = 1.34371$                          |                           |
| 13  | Kreis c            | Kreis durch Up, center, Counterup $c$: $X = (-0.08333, 0, 0.66667) + (-0.37428 \cos(t) - 0.4479 \sin(t), 0.24952 \cos(t) - 0.22395 \sin(t), -0.49904 \cos(t) + 0.4479 \sin(t))$ |                           |
| 14  | Punkt P            | $P = (0, 0, 1.33333)$                                         |                           |
| 15  | Punkt Gluon1       | $\text{Gluon1} = (0.83205, 0.5547, 0)$                        |                           |
| 16  | Gerade k           | Gerade durch Gluon1 parallel zu $z$-Achse $k$: $X = (0.83205, 0.5547, 0) + \lambda (0, 0, 1)$ |                           |
| 17  | Vektor u           | $\text{Vektor}(W2, P)$ $u = (0, 0, 1)$                        |                           |
| 18  | Punkt Gluon2       | $\text{Gluon2} = (-0.83205, -0.5547, 0)$                      |                           |
| 19  | Gerade p           | Gerade durch Gluon2 parallel zu $z$-Achse $p$: $X = (-0.83205, -0.5547, 0) + \lambda (0, 0, 1)$ |                           |
| 20  | Strecke g          | Strecke Gluon2, Gluon1 $g = 2$                                |                           |
| 21  | Punkt Gluon7       | $\text{Gluon7} = (1, 0, 0)$                                   |                           |
| 22  | Gerade q           | Gerade durch Gluon7 parallel zu $z$-Achse $q$: $X = (1, 0, 0) + \lambda (0, 0, 1)$ |                           |
| 23  | Kreis e            | Kreis durch Gluon1, Gluon7, Gluon2 $e$: $X = (0, 0, 0) + (0.28978 \cos(t) - 0.95709 \sin(t), -0.95709 \cos(t) - 0.28978 \sin(t), 0)$ |                           |
| 24  | Vektor b           | $\text{Vektor}(Punkt(z$-Achse), P)$ $b = (0, 0, 1.33333)$     |                           |
| 25  | Strecke f          | Strecke $W2$, $P$ $f = 1$                                     |                           |
| 26  | Vektor w           | $\text{Vektor}(W2, \text{center})$ $w = (0, 0, -0.33333)$     |                           |
| 27  | Kugel a            | Kugel durch Gluon1 mit Mittelpunkt $W1$ $a$: $x^2 + y^2 + (z - 0.66667)^2 = 1.44444$ |                           |
| 28  | Punkt E            | Schnittpunkt von $k$, $a$ $E = (0.83205, 0.5547, 1.33333)$    |                           |
| 29  | Punkt F            | Schnittpunkt von $p$, $a$ $F = (-0.83205, -0.5547, 1.33333)$  |                           |
| 30  | Strecke r          | Strecke $F$, $E$ $r = 2$                                     |                           |
| 31  | Punkt G            | Schnittpunkt von $q$, $a$ $G = (1, 0, 1.33333)$               |                           |
| 32  | Kreis d            | Kreis durch $G$, $E$, $F$ $d$: $X = (0, 0, 1.33333) + (-0.28978 \cos(t) - 0.95709 \sin(t), 0.95709 \cos(t) - 0.28978 \sin(t), 0)$ |                           |
| 33  | Gerade j           | Gerade durch $W2$ parallel zu $x$-Achse $j$: $X = (0, 0, 0.33333) + \lambda (1, 0, 0)$ |                           |
| 34  | Gerade l           | Gerade durch $W2$ parallel zu $g$ $l$: $X = (0, 0, 0.33333) + \lambda (0.83205, 0.5547, 0)$ |                           |
| 35  | Punkt A            | Schnittpunkt von $j$, $q$ $A = (1, 0, 0.33333)$               |                           |
| 36  | Punkt B            | Schnittpunkt von $k$, $l$ $B = (0.83205, 0.5547, 0.33333)$    |                           |
| 37  | Punkt C            | Schnittpunkt von $p$, $l$ $C = (-0.83205, -0.5547, 0.33333)$  |                           |
| 38  | Kreis t            | Kreis durch $A$, $B$, $C$ $t$: $X = (0, 0, 0.33333) + (-0.28978 \cos(t) - 0.95709 \sin(t), 0.95709 \cos(t) - 0.28978 \sin(t), 0)$ |                           |
| Nr. | Name         | Beschreibung                                                                 | Wert                                      |
|-----|--------------|-------------------------------------------------------------------------------|-------------------------------------------|
| 39  | Vektor v     | Vektor(C, F)                                                                 | $v = (0, 0, 1)$                           |
| 40  | Vektor m     | Vektor(A, G)                                                                 | $m = (0, 0, 1)$                           |
| 41  | Vektor n     | Vektor(B, E)                                                                 | $n = (0, 0, 1)$                           |
| 42  | Kugel o      | Kugel durch Gluon1 mit Mittelpunkt W1                                        | $o: x^2 + y^2 + (z - 0.66667)^2 = 1.44444$|
| 43  | Text Text1   |                                                                                | "4/3"                                     |
| 44  | Text Text3   |                                                                                | "1/3"                                     |
| 45  | Text Text4   |                                                                                | 'lower Gluons on Zero plane'              |
| 46  | Gerade h     | Gerade durch Down3 parallel zu xAchse                                         | h: $X = (0.08333, 0, -0.33333) + \lambda (1, 0, 0)$ |
| 47  | Text Text5   |                                                                                | "-1/3"                                    |
| 48  | Punkt D      | Schnittpunkt von e, xAchse                                                    | D = (1, 0, 0)                             |
| 49  | Punkt H      | Schnittpunkt von e, xAchse                                                    | H = (-1, 0, 0)                            |
| 50  | Gerade g     | Gerade durch H parallel zu zAchse                                             | g: $X = (-1, 0, 0) + \lambda (0, 0, 1)$   |
| 51  | Punkt I      | Schnittpunkt von o, g                                                        | I = (-1, 0, 0)                            |
| 52  | Punkt J      | Schnittpunkt von o, g                                                        | J = (-1, 0, 1.33333)                      |
| 53  | Text Text6   |                                                                                | "upper Gluons"                            |

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REFERENCES

[1] Scheuber H. Standard Model Picture with 61 Elementary Particles. *IJAMP*, 2018; 4(2): 42–49. Doi: 10.11648/ijamp.20180402.12.
[2] Scheuber H. From the 3D Construction of Gell-Mann to the Higgs Field with Data. *European Journal of Applied Physics*, 2021; 3(4): 932.
[3] No special constructions of Neutron and Proton found garnish
[4] Scheuber H. Standard model with 61 elementary particles in stereo picture. 2016. Retrieved from https://www.researchgate.net/publication/305851350_Standardmodel_with_61_elementary_particles_in_stereo_picture.
[5] Wikipedia-Autoren. *Eightfold Way* –. September 10, 2022. [Internet] Retrieved from https://de.wikipedia.org/wiki/Eightfold_Way+.
[6] Siegel E. What Rules the Proton: Quarks or Gluons? *Forbes*: https://www.forbes.com> 2021/03/18.