

## A Preon Model from Manasson's Theory II

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In this short note I resubmit the model presented in [vixra.org/abs/1002.0054](https://vixra.org/abs/1002.0054) with some corrections.

The mass of the Higgs boson has an integer relation with a particle of the model.

In [1,2] Manasson applied dissipative chaos theory to particle physics, presenting a formula relating the fine structure constant  $\alpha$  with Feigenbaum constant  $\delta$ :

$$\alpha = (2\pi\delta^2)^{-1}$$

Following his schema we were led, assuming a principle of halving of the quantum number at every bifurcation, to conjecture the existence of the “mark” and of the “supermark”, two particles with spin  $\frac{1}{4}$  and  $\frac{1}{8}$ , respectively.

### Proposed schema of particles

	spin	charge	strong	weak	dim (s,t)	mass
<b>graviton</b>					<b>1 (1,0)</b>	
<b>photon</b>	<b>1</b>				<b>2 (2,0)</b>	
<b>electron</b>	$\frac{1}{2}$	<b>1</b>			<b>4 (3,1)</b>	<b>me = 0.511 MeV</b>
<b>mark</b>	$\frac{1}{4}$	$\frac{1}{2}$	<b>1</b>		<b>8 (6,2)</b>	<b>me/4<math>\alpha</math> = 17.5 MeV</b>
<b>supermark</b>	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{2}$	<b>1</b>	<b>16 (12,4)</b>	<b>me/(4<math>\alpha</math>)<sup>2</sup> = 586.5 MeV</b>

At every bifurcation a new quantum number springs up, and previous quantum numbers are halved. The four quantum numbers are spin, electric charge, “strong charge” and “weak charge”.

It seems that the hypothetical dissipative nonlinear dynamical process underlying the production of particles creates also dimensions. The fabric of particles is the fabric of spacetimes. [3]

A spin zero graviton could live and be described in one dimension; the production of two photons from one graviton needs one more dimension, and permits the appearance of spin.

Next doubling is related with space-time as we know it: if we assume a quaternionic structure, time could be the real dimension and irreversibility of time could be in relation with non-commutativity of quaternions.

Next doubling produces an octonionic world : if we assume that the temporal dimension doubles, we have a real (linear) time and an imaginary (circular) time.

A “quaternion-valued time” is cited in “Quantum Mechanics and Gravity” by Mendel Sachs.

## Relations between masses of particles

As **two** electrons form a Cooper pair, **four** marks should be necessary to form a stable and saturated configuration, a sort of Cooper quartet.

**Eight** supermarks, also, should be required to form a Cooper octet.

We observe the following relations between masses of particles and mass of the supermark:

$$\mathbf{W} \quad 136 = 17 \times 8$$

$$\mathbf{Z} \quad 152 = 19 \times 8$$

$$\mathbf{Top} \quad 288 = 36 \times 8$$

$$\mathbf{Higgs} \quad 424 = 53 \times 8$$

It can be noticed that  $53 - 36 = 17$  and  $36 - 19 = 17$

Moreover, it can be noticed that up and down quarks could be composed of **18** marks: perhaps **17** and **18** are in relation with the stabler clusters of marks and supermarks.

## Neutrino masses

Thinking of neutrinos as composite particles [4], one can wonder why they are so light. One explanation could be this: the mass of a particle could be not a scalar but a vectorial quantity the dimension of which is in relation with the dimension of the space-time the particle lives in. In the literature one can find the concept of “quaternionic mass”.

So the measured neutrino mass could be like the little projection on the real axis of a vector big in modulus.

## Dedication

To Marilinda, my love.

## References

[1] Vladimir A. Manasson [Are Particles Self-Organized Systems?](#) 2008

[2] Vladimir A. Manasson [Self-Interacting Electron as a Nonlinear Dynamical System](#) 2006

[3] Frank Tony Smith [From Sets to Quarks](#) 1997

“The three representations for spacetime, fermion particles, and fermion antiparticles are EACH 8-dimensional with Octonionic structure. They are ALL isomorphic by the Spin(8) Triality Automorphism, which can be represented by rotating or interchanging the 3 arms of the Dynkin

diagram of Spin(8). The Triality isomorphism between spacetime and fermion particles and fermion antiparticles constitutes a SUBTLE SUPERSYMMETRY between fermions and spacetime.

Frank Tony Smith [Spinor Doubling and Evolution of Our Universe](#) 2013

[4] P. Kovtun, A. Zee [A schematic model of neutrinos](#) 2006

#### Additional References

F. Tamburini, M. Laveder [Apparent Lorentz violation with superluminal Majorana neutrinos at OPERA?](#) 2011 (Argue that neutrino mass is a complex number)

M. Gogberashvili [Octonionic Version of Dirac Equations](#) 2005

P. Palazzi [Mass Rules, Shell Models and the Structure of Hadrons](#) 2015

R. M. Kiehn [A Remark on the Symmetry Breaking of Space-Time](#) 1992

“Schultz [6] who found exact quaternionic solutions to Maxwell's equations that indicated that the speed of propagation in the inbound and outbound directions would be different for such waves. This result was in agreement with the ring laser experiments of Sanders.”

Valeriy I. Sbitnev [Physical vacuum is a special superfluid medium](#) 2015

Stanislav Kuperstein, Ayan Mukhopadhyay [Spacetime emergence via holographic RG flow from incompressible Navier-Stokes at the horizon](#) 2013