Calculation of the muon mass

Norbert Buchholz

Abstract

In this paper, the formation of muons is attributed to the decay of neutrons by the action of very hard γ-radiation. This is based on a model of the neutron that we presented in a paper recently published here[1]. From the decay mechanism, a mass of 206.781 electron masses (m_e) could be calculated for the muon, which agrees very well with the measured [3]value of 206.768 m_e. This decay mechanism also very plausibly explains the occurrence of the three types of muonium, muon μ-, anti-muon μ+ and muonium μ+-

A Introduction

Muons are considered exotic particles that were used some time ago in the search for voids in the Great Pyramid of Giza and thus received a certain amount of publicity outside the scientific community[5].
Their mass, in particular, was previously a complete mystery. Although their mass is about 1/9 of the proton mass, established physics classifies them as leptons, just like electrons. This seems to us to be a very opportunistic point of view, as they can thus be regarded as point-like, which in turn is a prerequisite for calculations using QED.
We have already pointed out in an earlier paper[6] that the assumption of point-like particles in a three-dimensional world is nonsensical, especially a particle with 1/9 of the proton mass.

According to particle and astrophysicists, muons are generated in the uppermost layers of the atmosphere (approx. 10 km altitude) by the cosmic radiation occurring there. They therefore belong to the secondary cosmic radiation. In our opinion, neutrons are first released from the air molecules by the very high-energy ion radiation prevailing there, which then interact with very hard γ-radiation.

B Calculations

According to projection theory, there is a minimum time t_{min} and consequently a maximum frequency f_{max}.

$$f_{\max} = \frac{1}{t_{\min}} = \frac{1}{4,40774165 \cdot 10^{-24}} = 2,26874 \cdot 10^{23} \left[Hz \right]$$

However, the maximum frequency was not useful here; for whatever reason, it had to be divided by ϕ in order to arrive at the frequency f_{rel}, which is relevant for the further calculations

$$f_{rel} = \frac{f_{\max}}{\Phi} = \frac{2,26874 \cdot 10^{23}}{1,61803398} = 1,40216 \cdot 10^{23} \left[Hz \right]$$

Φ = 1,61803398

If we allow this radiation, which is relevant for the formation of muons, to act on a neutron and it is completely absorbed there, we obtain an increase in mass according to the equation below,

$$m_{rel} = \frac{1,40216 \cdot 10^{23} h}{c^2} = 1,03374 \cdot 10^{-27} \left[kg\right]$$

consequently, a hyper heavy neutron with the mass

$$m_{rel} + m_N = 2,708667 \cdot 10^{-27} \left[kg\right]$$

or in electron masses

$$N_{m_e} = \frac{m_{rel} + m_N}{m_e} = 2973,491 \text{ } m_e$$

This heavy particle cannot be stable, as it is clear from projection theory (see Ref. 2) that the proton with 1836 electron masses is the heaviest stable particle.
The decay of this superheavy particle is easy to understand. It is a cube with the edge length s_{cub} measured in electron masses,

$$s_{cub} = \sqrt[3]{2972,488} = 14,398 \text{ } m_e$$

which decays into square disks with the thickness of one electron mass, each consisting of

$$14,3758^2 = 206,781 \text{ } m_e$$

electron masses.
These disks correspond to our muons, provided they contain e-, e+ or both. The value calculated above is in excellent agreement with the value measured for the muon.

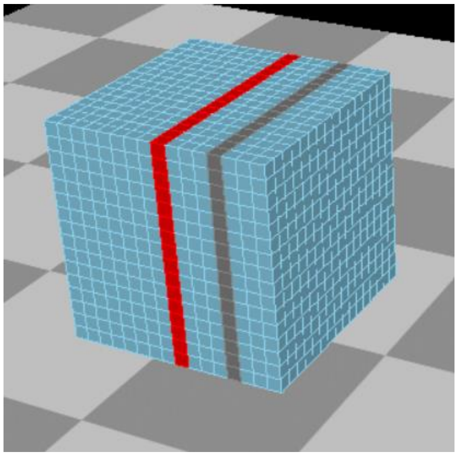
[3]206.768283 m_e

The value calculated by us is slightly higher than the literature value, which can possibly be explained by the fact that the energy required to separate the layers was not taken into account in our calculation.

C Decay mechanism

When the neutron splits, three different decay products can be formed: a negative, a positive and an uncharged particle with both partial charges, which are known in particle physics as muon, antimuon and muonium.

The formation of an anti-muon is restricted to the middle layer (marked red in Fig. 1), as the positron is centrally localized. The muon itself can form in all layers in which the electron in the neutron has a probability of residence. The gray layer in Fig. 1 therefore represents only one of several possibilities. However, this does not mean that more muons are produced than their antipodes, since each neutron contains one positron and one electron and therefore the two types of muons are always produced in the same quantities.

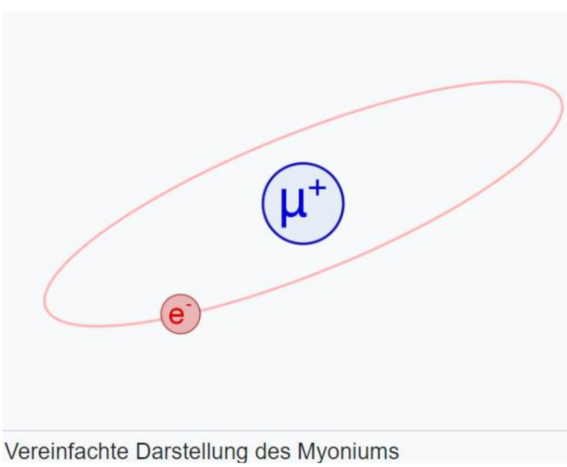


.

Fig. 1 Illustration of the massive "neutron"

In exceptional cases, when positron and electron happen to be in the same layer during decay, we obtain an outwardly uncharged muon, which we want to call a neutron-muon, since it represents a quasi "two-dimensional" neutron. In our opinion, this is not identical to the muonium described in the scientific literature, a construct consisting of an antimuon and an electron, which can be described as light hydrogen that has been studied quite well spectroscopically[4] (see Fig. 2). The red layer in Fig. 1 therefore represents two different muons, the antimuon and the rarer neutron-muon.

It can be assumed that the neutron muons we postulate are very unstable with decay times that are even orders of magnitude shorter than those of muon and antimuon, so that these particles are not observed on the Earth's surface. The decay is very simple for us as an electron jump from the interior of the original neutron of approx. 10^{-16} m to the Bohr orbits of the hydrogen atom of approx. 10^{-11} m, whereby the spectrum of hard γ-radiation shown in Fig. 3 is released and the muonium, i.e. the "light hydrogen atom" (~1/9 H) shown in Fig. 2, is formed.



[7]Fig. 2 Illustration of the muonium

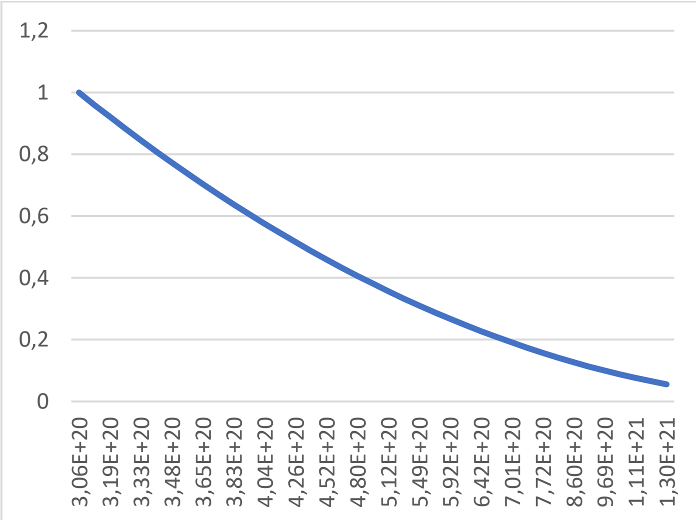


Fig. 3 Abscissa: γ-radiation released by the decay of neutron-muons (Hz)
Ordinate: relative proportion of the total radiation

It is still unclear why obviously only a very specific frequency (f_{rel}) from the range of hard γ-radiation (resonance frequency?) is suitable for splitting the neutron into muons and why this frequency is mathematically linked to the maximum frequency f_{max} via the golden number.

References

[1]viXra: 2402.0122 Inside the Neutron

[2]viXra:2104.0093 The Projection Theorie

[3]*CODATA Recommended Values.* National Institute of Standards and Technology, retrieved July 4, 2019 (English).

[4]Klaus P. Jungmann: *Precision Muonium Spectroscopy*. In: *J. Phys. Soc. Jpn.* Band 85, 2016, S. 091004

[5]*Nature* **volume 552**, pages386–390 (2017)
Discovery of a big void in Khufu's Pyramid by observation of cosmic-ray muons

[6]viXra: 2303.0062 The size of the Electron

[7]arXiv:nucl-ex/0404013