

The Extra-Terrestrial -Intelligence Wow! Signal Leads to the PMNS Neutrino-Mixing Matrix

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Abstract: The Wow! signal was a radio signal received on August 15, 1977, by Ohio State University's Big Ear radio telescope. Here we try to show that the Wow! signal was emitted by an ETI (Extra Terrestrial Intelligence) because it leads to the PMNS neutrino-mixing matrix.

1. Introduction

The Wow! signal was a radio signal received on August 15, 1977, by Ohio State University's Big Ear radio telescope. Most of its operation was in the 21-cm radio band. The receiver covered an 8-MHz bandwidth from 1411 to 1419 MHz. The string of numbers and characters "6EQUJ5---01100100" we see in channel 2 of the printout [1]. I assume that the end of the string/sequence, i.e. the last zero, is pointed by the cipher 1 in channel 1 [1].

The signal-strength sequence "6EQUJ5" in channel 2 of the computer printout represents the following sequence of signal-to-noise ratios [1]:

6 → 6 (up to 7)

E → 14 (up to 15)

Q → 26 (up to 27)

U → 30 (up to 31)

J → 19 (up to 20)

5 → 5 (up to 6)

The intensity received (for example, "E") means that the signal was 14.5 ± 0.5 times stronger than the background noise.

Here we try to show that the Wow! signal was emitted by an ETI (Extra Terrestrial Intelligence) because it leads to the PMNS neutrino-mixing matrix.

2. Justification for the thesis

We can assume that the second part of the string, i.e. the part composed of the zeros and ones, i.e. the part composed of the low signal-to-noise ratios: "01100100", shows whether we correctly measured the signal intensities for the main part "6EQUJ5". We know that in the binary system, the sequence 1100100 represents number 100. On the other hand, the sum

$$6 + E + Q + U + J + 5 \rightarrow 6 + 14 + 26 + 30 + 19 + 5 = 100$$

is equal to 100 also. It leads to conclusion that measured intensities for “6EQUJ5” are correct.

The intensity variation of the radio signal over time we can fit with a Gaussian function [1]. The 6, E and Q lie on the increasing part of the function whereas the U, J and 5 lie on the decreasing one. It suggests that following pairing is possible (from up to down of the Gaussian function): QU, EJ and 65. Differences in intensities for the components of the pairs are as follows:

$$U - Q \rightarrow 30 - 26 = 4$$

$$J - E \rightarrow 19 - 14 = 5$$

$$6 - 5 = 1$$

The ratios of the differences are as follows:

$$(U - Q) : (J - E) : (6 - 5) = 4 : 5 : 1$$

On the other hand, the PMNS matrix is parameterized by three mixing angles. We can arrange the mixing angles because of the indicators: Θ_{12} , Θ_{23} and Θ_{13} . In the Scale-Symmetric Theory (SST), their ratios (exact) are [2]

$$\Theta_{12,SST} : \Theta_{23,SST} : \Theta_{13,SST} = 4 : 5 : 1 \quad (33.0616^\circ : 41.3250^\circ : 8.2654^\circ).$$

The experimental 3σ allowed ranges of the 3-neutrino oscillation parameters, derived from a global fit of the current neutrino oscillation data [3] are collected in Table 1.

Table 1. *Mixing angles from experiments* [3]

Mixing angle	Mixing angles [°] [3]
Θ_{12}	30 – 36.5
$\Theta_{23}, \Delta m^2 > 0$	38 – 51.7
$\Theta_{13}, \Delta m^2 > 0$	7.82 – 9.02

We can see that the SST parameters overlap with the intervals defined by experiments. It is very important that the Wow! signal leads to the SST results.

References

- [1] Dr. Jerry R. Ehman (Original Draft Completed: July 9, 2007; Last Revision: 28 May 2010). “The Big Ear Wow! Signal”
<http://www.bigear.org/Wow30th/wow30th.htm>
- [2] Sylwester Kornowski (23 February 2018). “Foundations of the Scale-Symmetric Physics (Main Article No 1: Particle Physics)”
<http://vixra.org/abs/1511.0188>
- [3] F. Capozzi *et al.*, arXiv:1601.07777