

The Mass-Energy Equivalence ($E = mc^2$) Hypothesis is Invalid

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Abstract

The $E = mc^2$ equation in Albert Einstein's theory of special relativity expresses the idea that mass and energy are the same physical entity and can be changed into each other. $E = mc^2$ is an unverifiable assumption that is considered proof for mass-energy equivalence. This is circular reasoning (*aka* begging the question), the logical error of including the conclusion in the assumption, then using the assumption to prove the foregone conclusion. Circular reasoning invalidates the mass-energy equivalence hypothesis. Nuclear fission and nuclear fusion are reactions in which matter is converted to energy. There are no reactions in which energy is converted to matter; it has never happened. Therefore, mass-energy equivalence is an erroneous concept.

Key words: *Einstein; Special Relativity; Mass-Energy Equivalence; Matter; Energy*

Introduction

Circular Reasoning

Circular reasoning (*aka* begging the question) is the logical error of including the conclusion in the assumption, then using the assumption to prove the foregone conclusion. Every hypothesis based on circular reasoning is invalid.

In 1927, astronomer Georges LeMaître presupposed that the universe is expanding and developed mathematics to support his foregone conclusion [1]. Circular reasoning invalidates the hypothesis that the universe was created by a singularity (*aka* Big Bang).

In 1929, Edwin Hubble made the unwarranted assumption that galaxies are accelerating away from each other and used contrived mathematics to justify his foregone conclusion [2]. Circular reasoning invalidates Hubble's Law.

Photons are presumed to exist because of their apparent effect on photoelectric systems (e.g., in a photomultiplier tube, on a microscopic capacitor, in a Geiger counter). What is being observed in these cases is electromagnetic energy moving electrons. The circular reasoning here is that photons are assumed to exist, and measuring their effects is proof of their existence [3].

In 2015, the LIGO observatories recorded a tiny chirp (32 Hz for 0.2 sec) in electromagnetic radiation received by their detectors and declared this measurement to have been caused by a gravitational wave. The circular reasoning here is that hypothetical gravitational waves are assumed to interfere

with electromagnetic radiation, and measuring their effects is proof that they do so [4].

Mass-Energy Equivalence Theory

The $E = mc^2$ equation in Albert Einstein's theory of special relativity expresses the idea that mass and energy are the same physical entity and can be changed into each other. In this equation, the increased relativistic mass (m) of a body times the speed of light squared (c^2) is equal to the kinetic energy of that body [5]. Kinetic energy is the form of energy that an object or particle has by reason of its motion [6].

$E = mc^2$ is an unverifiable assumption that is considered proof for mass-energy equivalence. This is circular reasoning (*aka* begging the question), the logical error of including the conclusion in the assumption, then using the assumption to prove the foregone conclusion. Circular reasoning invalidates the mass-energy equivalence hypothesis.

Nuclear fission and nuclear fusion are reactions in which matter is converted to energy. There are no reactions in which energy is converted to matter; it has never happened. Therefore, mass-energy equivalence is an erroneous concept.

Nuclear fission is a reaction in which the nucleus of an atom splits into two or more smaller nuclei. The fission process releases a very large amount of energy [7].

In some reactions, matter particles can be destroyed, and their associated energy released to the environment as other forms of energy, such as light and heat. One example of such a conversion takes place in elementary particle interactions,

where the rest energy is transformed into kinetic energy [8].

In nuclear weapons, the protons and neutrons in atomic nuclei lose a small amount of their original mass. Nuclear fission allows a tiny fraction of the energy associated with mass to be converted into radiation energy [9].

Nuclear fusion is the process by which nuclear reactions between light elements form heavier elements. In cases where the interacting nuclei belong to elements with low atomic numbers, substantial amounts of energy are released [10].

Conclusion

The $E = mc^2$ equation in Albert Einstein's theory of special relativity is an unverifiable assumption that is considered proof for mass-energy equivalence. This circular reasoning, including the conclusion in the assumption then using the assumption to prove the foregone conclusion, invalidates the mass-energy equivalence hypothesis. Nuclear fission and nuclear fusion are reactions in which matter is converted to energy. There are no reactions in which energy is converted to matter; it has never happened. Mass-energy equivalence is an erroneous concept.

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