

Thermodynamical Balance Associated with Energy Transfer Analysis of the Universe Space as a Pressure Vessel Analogy

*Emin Taner Elmas**

İskenderun Technical University (İSTE), Department of Energy Systems Engineering, Turkey

***Corresponding author:** *Department of Energy Systems Engineering, Faculty of Engineering and Natural Sciences, İskenderun Technical University (İSTE), Main Campus 31200, İskenderun/Hatay-Turkey. Tel: +90(0)5437336421; Email: taner.elmas@iste.edu.tr*

Citation: *Elmas Emin Taner (2019) Thermodynamical Balance Associated with Energy Transfer Analysis of the Universe Space as a Pressure Vessel Analogy. Journal of Applied Sciences: RD-APS-10002.*

Received Date: 8 January 2019; **Accepted Date:** 21 January 2019; **Published Date:** 25 January 2019

It may be possible to establish an analogy between the universe space and a pressure vessel inner body shell e.g. a superheated steam power boiler. Basically, the universe has a periodic thermodynamic cycle consisting of a conversion process between energy and matter.

The universe space is full of undefinable amounts of energy stacks and matters. The forms of these energy stacks and matters are also uncertain. That is, both the quality and quantity of them cannot be introduced. Sometimes, they are called as “Dark Energy” and “Dark Matter”. The accumulation of energy stacks may be very dense within some regions of the universe space.

The blackholes, wormholes, neutron stars, supernovas, planetary stars, planets, exoplanetary systems, pulsars and gravitational forces have great amount of energy and matter within their mysterious structures. A great accumulation of energy, existing within the space anywhere, give a magnificent opportunity to be able to even bend the space and time. There are millions of galaxies containing huge amounts of energy including the cosmic radiation and gravitational waves. The region of interstellar medium is also another indefinite source for energy and matter.

The entropy has to be identified in order to the ability to understand the real aspects of thermodynamical balance associated with energy transfer analysis of the universe space. An analogy can be made to state the model of such a thermodynamical cycle within the universe itself. This analogy can be an engineering technique approach and a pressure vessel may be accepted as a model for the universe space. The most appropriate pressure vessel can be a superheated steam power boiler; therefore, the problem can be solved as if it is an ordinary technical situation.

Regarding the law of conservation of energy, there should be a total mass and energy balance through all the universe, very similar to the situation as for the superheated steam power boiler which is one of the main equipment for a conventional power production plant system.

Additionally, by considering the second law of thermodynamics, there are always losses for the energy systems and it is not possible to reach full hundred percent efficiency rate, neither for those systems, as in the case of a steam boiler or pressure vessel, nor as for the whole universe, however the total energy and mass are always conserved on condition that there are some energy and matter conversion processes balancing the thermodynamics of universe and of the boiler system as well if an analogy is established between the space universe and the steam boiler, which is a kind of a pressure vessel. Since there are a lot of losses, the entropy of the universe should always increase, that means the universe is under a great pressure. Therefore, the universe space may be accepted as a superheated steam power boiler if it is treated like a pressure vessel, a part of the energy system. Besides, an analogy can be established for the energy transfer analysis between both systems, which are the universe space and the steam boiler when they are both considered as pressure vessels.

Another point of view is to realize an approach for exergy (availability) and anergy of the entire system, since the total energy is equal to the sum of exergy and anergy amounts. That is, “Energy = Exergy + Anergy”, indicating the formulation as $E = \emptyset + A$, representing E for Energy, \emptyset for Exergy and A for Anergy, respectively. This balancing thermodynamical formulation is valid for both the analogical systems, which are the universe space and the steam boiler, if both have a common technical analogy of pressure vessel from the aspect of energy transfer analysis and conversion of energy and matter while they both have in dynamic operational cycle mode. The main scientific parameters governing this equation, which is $E = \emptyset + A$, can be stated as follows: pressure, temperature, flow rate, enthalpy, entropy, specific heat, internal energy as well as the cosmic radiation parameters. All these parameters provide the thermodynamical balance associated with energy transfer analysis of the universe space as a pressure vessel analogy.

As a result, it is possible to say that such an analogy for the universe space can certainly be realized and it means that our universe has a periodic thermodynamical cycle and energy mass balance consisting of a conversion process between energy and matter and the thermodynamical cycle of the universe is very similar to a boiler pressure vessel system which is the main part of a power plant and energy production system. The energy transfer analysis for both systems has also the same analogy.

References

1. Elmas, Emin Taner (2017) Productivity and Organizational Management (The Book) (Chapter 7): Prospective Characteristics of contemporary Engineer (By the Approach of Mechanical Engineering) Contribution and Role of the Mechanical Engineer to the Organization Management and Productivity, DeGruyter, Germany.
2. Krischer Katharina, Schönleber Konrad (2015) Physics of Energy Conversion, Boston / Berlin, DeGruyter .
3. Elmas, Emin Taner (2014) Çağımızın Mühendisinden Beklenenler, Gece Kitaplığı.
4. Çengel, Yunus A, Boles, Michael A (2008) Termodinamik, Mühendislik Yaklaşımıyla, Güven
5. Bilimsel.