

**Research/Technical Note**

# A Patent of a Real Model of Hurricane and Way to Prevent It

Ali Algaddafi<sup>1, \*</sup>, Siham Hasan<sup>1</sup>, Rema Farhat<sup>2</sup><sup>1</sup>Electrical and Electronic Department of Engineering and Computer Science, Sirte University, Sirte, Libya<sup>2</sup>Department of Computer Science, Asmarya University, Ziletin, Libya**Email address:**

alisite@yahoo.com (A. Algaddafi), sohe\_84@yahoo.com (S. Hasan), az161173@yahoo.com (R. Farhat)

\*Corresponding author

**To cite this article:**Ali Algaddafi, Siham Hasan, Rema Farhat. A Patent of a Real Model of Hurricane and Way to Prevent It. *Petroleum Science and Engineering*. Vol. 2, No. 1, 2018, pp. 33-36. doi: 10.11648/j.pse.20180201.15**Received:** March 24, 2018; **Accepted:** April 15, 2018; **Published:** May 17, 2018

---

**Abstract:** The scientists believe that rising sea level and increasing average temperatures are the main reasons to further expanding the destructions by the hurricane. However, the natural disasters become serve dangerous for human and the land. Therefore, this paper will focus on modelling hurricanes in order to carry out the experimentation in the laboratory. The model hurricanes could be presented as a small machine that has a motor to control the wind speed. But this model requires verification in real life. Also, the volume of the atmosphere is assumed to be fixed. This may not be true as the volume of the atmosphere is unknown so far. The outcomes are that the hurricanes will be a possible modelled and the generate of electricity from the wind of hurricanes could be a fact in future.

**Keywords:** Hurricanes, Model, Natural Disaster, Climate Change, Carbon Dioxide

---

## 1. Introduction

It is important to highlight the innovation and contribution in the United Kingdom (UK) especially in the treatment of the natural disaster such as a hurricane. There are many sectors in real life that we can invent the innovation, but the importance that innovation reduces of climate change and carbon dioxide. Also, reducing or preventing the natural disaster is very important. A natural disaster could be earthquake and landslide, sinkholes, floods, volcanic droughts, tornadoes, hurricanes and so further on [1]. There is a different definition of a natural disaster such as it is either an unusual increase in the number of cases of destruction or an infectious disease as presented in [2].

The NASA uses instruments to analyse a different aspect of storms such as an arsenal. Also, there is a powerful NASA research tool such as Global Modelling and Assimilation Office (GMAO) as presented in ref [3]. However, these tools of GMAO only help to identify information and prediction of hurricane system. Although there is a probe of the Cyclone Global Navigation Satellite system that can be located in the inner core of hurricanes to get more information and details. But, this is very difficult to determine the core of the hurricane.

If the core of the hurricane can be determined in an easy way, then the simplicity of a model that has been proposed in this paper will be very useful. Hurricane-based search Algorithm was presented by Rbough and El Imrani [4], however, the results are depending on the statically results and it may not be validated or verified in real time. There is only one method that has been noticed during the research, is applied to model the development if instabilities of the tropical cycle. This method is called the two-layer moist-corrective rotating shallow water model as presented by Rostami and Zeitlin [5]. The paper in ref. [5], could be useful, but it does not provide detail to model small hurricane.

This paper will focus only on hurricanes and model it and how to prevent it. Section 2 presented a theory a patent model of a real hurricane. Section 3 discussed the methodology and proposed a model of a hurricane. The fourth is required for verification of the model which may solve the problem of the hurricane. The final section is given the conclusion. As a part of future work, the proposed new invention that will open the door for other researchers is discussed briefly.

## 2. A Theory of Patent Model of a Real Hurricane

### 2.1. Background about Climate Change and Cause of Hurricane

The scientists believe that there is a significant relationship between hurricanes and climate change. In my points of views, if we see rules that will help us to understand the basic problem of climate change such general gas equation, which is obtained by combing three rules of, Charle's Law, Boyle's Law and Gay-Lussacis Law, which is given by the ideal gas law as [6]:

$$\frac{P_1 V_1}{T_1} = \frac{P_2 V_2}{T_2}$$

Where P is the pressure, V is the volume and T is the temperature. The volume of the atmosphere is considered as a fixed. But, how to apply for sea level and climate change nowadays. In a simple way, that if the temperature increases, the pressure will increase consequence [7]. This is interpreting the rising sea levels due to climate change. This is why CO<sub>2</sub> must be reduced. This is why the electric vehicles and all innovations and research should be applied or worked in this direction. In this patent that hurricanes will be reviewed and modelled. This model helps to understand the character of the hurricane so far and make the experimentations in the laboratory are accessible. Then we can apply to the real hurricane once it is successful.

Natural disasters should not be fought, but we should

deploy them and understand how to get the benefit of these Natural disasters. E.g., how to generate electricity from Natural disasters. All the previous work in this sector is very useful, especially the work of Prof. Stephen Salter in this field and his innovations. Although Prof. Stephen Salter is retired, he still, works in full time in this field. However, there is no solution for reducing the impact of hurricanes and prevent it so far. Hence, we need all to work as a team to find a way to stop and prevent a hurricane. The proposed a small model of a hurricane is the best of knowledge to model the hurricane so far. Also, the proposed model is stated that generate electricity could be possible, once create a large generator that should locate in the centre of a hurricane if the centre of the hurricane is determined through the NAS or satellite [8].

According to [9] a warmer atmosphere, that has more water vapour to worsen rainstorms and also has higher ocean surface temperatures, leads to intensify hurricanes. Therefore, an urgent solution for reducing the impact of climate change is required. In fact, atmospheric carbon dioxide level increase due to the consumption of fossil fuels, as notice from ref. [9] that rainfall of Hurricane Harvey was three times more likely than the storm in the early 1900s. For example, according to [9], Harris country rainfall produces 1.3 meters (51.89 inches). While in ref. [10] the consensus scientists that the climate change has many effects such as rising sea levels as in shown in Figure 1. This figure shows that global sea levels have been raised 86 millimetres as observed by satellites from period 1993 to 2017. Warmer oceans made the storms of Harrey and Irma more destructive than the previous decades. Not only this, but it can enough to swamp many coastal regions.

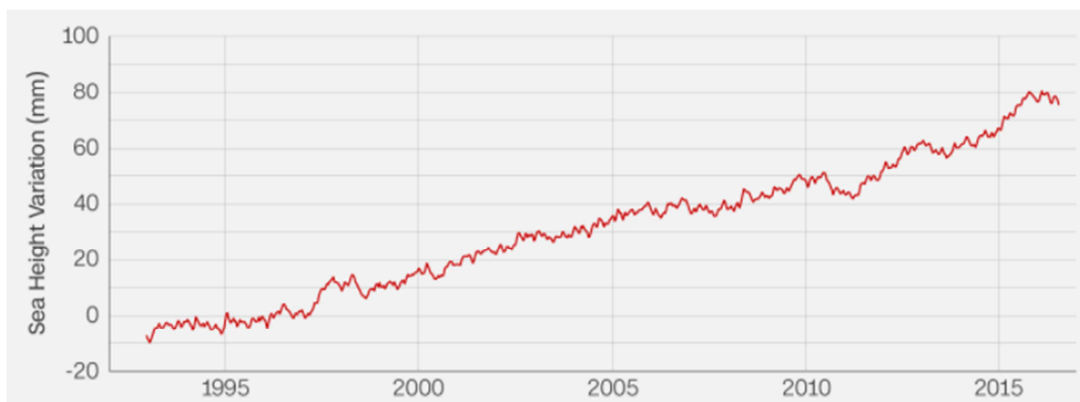


Figure 1. Rising sea levels Vs years [10].

### 2.2. The Motivation for This Innovation

There is no evidence that can predict the hurricane and its losses for a long time, but also there are no procedures to stop it. A hurricane is a one of natural disaster, which caused a massive destruction. According to [10], the data on how the warming climate specifically influenced Harrey and Irma won't know so far. According to [11], Hurricane Marina caused humanitarian crisis for 3.4 million people who are struggling without clean water and electricity. This damage and humanitarian crisis due to a natural disaster of hurricane lead to investigate how to model hurricane and find the way to

prevent its development. Hence, investigations into this matter are required further work.

### 2.3. Aim and Objectives

The main aim is to understand the characteristics of the hurricane and then model it. The objectives are to stop or prevent developing hurricanes and storms. Not only stopping but the advantage of hurricanes that electricity could be possibly generated, where wind energy in a hurricane is equal around half of the world electricity generation in a year [11]. Therefore, generated electricity from Hurricane would be very

useful. As there is no single procedure to stop or prevent a hurricane, the researchers can investigate from different points to find a suitable solution for the natural crisis. But the researchers should build their idea based on the previous studies to achieve a high quality of research in this field. For example, the area of power electronics or renewable energy and design control instrument, the first step is the dynamic model to represent the system either photovoltaic systems, wind power, machine or motor or so further on. Secondly, the dynamic model will help to investigate before carrying out the different experimentations with it. However, in case of a hurricane, it is difficult to predict the dynamic model. But a hurricane can be assumed as motor because, in the blender machine, the motor creates the same behaviour and form of a hurricane.

### 3. The Methodology of This Paper and Model of Hurricane

#### 3.1. Methodology

The researchers and scientists are using temperature, moisture, and wind to steer when and where hurricane occur [11]. Wave energy for a hurricane was studied since 1970, while in 2003; the researchers in engineering design at the University of Edinburgh started using energy to cool the seas by using the giant tube, where a Wave-Powered Pump (WPP) was inverted. This WPP moves warm surface water down to depths as far as around 198 meters (650 feet).

The idea was that produced using a ring of tires lashed together around a tube stretching out beneath the surface, waves would overtop the ring, pushing the column of water down, while a check valve in the tube would shield it from streaming back. Also, there is another way to stop Hurricane by making clouds a tiny but bright as (the Twomey effect) as presented by the authors in ref.[11]. However, this procedure may be expensive where the construction of a prototype cloud would cost £28.76 (\$40) million. However, the researchers so far cannot stop the Hurricanes and failed miserably, which cause huge destruction. This is why the proposed a procedure below to model Hurricanes would be useful.

#### 3.2. Proposed Model of Hurricane

The idea is that model hurricane in a simple way that should be carried out and then attempt to stop it could be studied. This model can be presented by blender machine or device, where the blending jar is filled with water. This is a real example of a hurricane, but if the motor of a blender is stopped, hence the hurricane can be prevented. There is no model of a real hurricane so far. Therefore, this is a new patent for this project so far. This is very useful for the scientists; we can create a large of the blender in the large pool and control the speed of wave or wind by controlling the motor speed. Then all procedures that are presented by Prof. Stephen Salter can be applied. However, as other any innovation, it has limitations, e.g. the centre of the hurricane is unknown, which is

challenging and will be part of future work. But, there is nothing difficult with technology. There is evidence for NAS to determine the centre as shown in Figure 2 and Figure 3. This innovation was created to entry to the “Roads for the Future” Competition. But it does not complete that time. It is required for more investigations and more tools. This would be a part of future work. But, let us assume that the centre of Hurricane is determined precisely. Then what’s the next step? We need to find the direction of hurricane either in clockwise or anticlockwise. It seems to be in a clockwise direction as in figure 2 and figure 3.

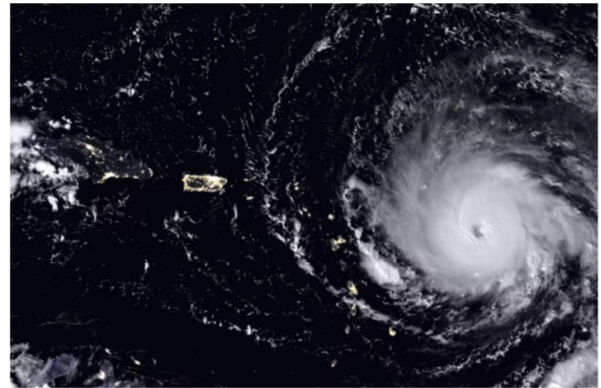


Figure 2. Hurricane Irma as view by a satellite- NASA [11].

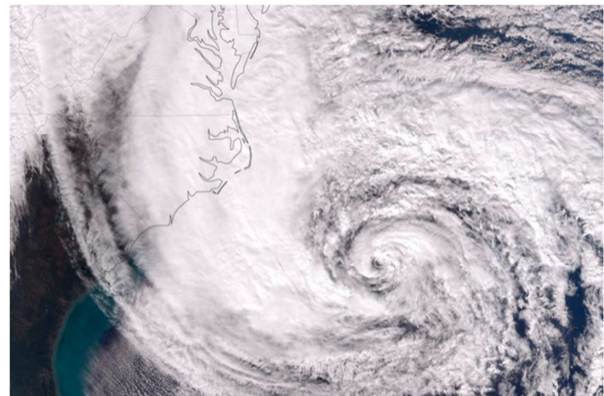
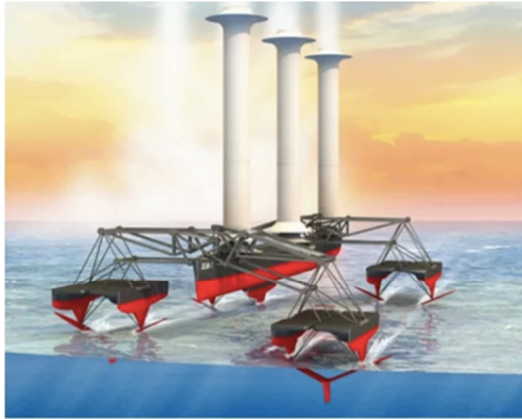


Figure 3. Hurricane Sandy [12].

Again, if the centre and the direction of the hurricane are determined, what else we can do? Here the invention and engineering design and scientist will work. The design of a large generator that generates electricity and also works against the direction of a hurricane in the centre will be developed. The ability to control two things the direction of the generator being opposite of hurricane wave and locating the generator should be considered in designing procedures. But the problem, how to fix or locate this giant of the generator with difficult and severe conditions, it is challenging as well. However, there is evidence to locate the generator such as in Figure 4. The same procedures could be implemented. Therefore, the patent will be built based on the previous study.



**Figure 4.** An aerosol-spraying boat as presented by Stephen Salter, at University of Edinburgh as on cloud brightening [11].

## 4. Conclusion

We believe this idea; will help us in future to make experimentation on the hurricane. Especially when climate change and gas emission are increasing sea levels, and the pressure under the Earth's plant will increase. It is expected a lot of hurricanes and other natural disasters. The climate change makes the hurricane more powerful, which lead to totally disastrous or catastrophic. This patent or idea needs to be developed urgently. The channel media tell us about the wind speed of hurricane and wave, hence we can create the same speed and conditions where the fundamental and characters of the hurricane are known.

The scientists believe that rising sea level and increasing average temperatures are the main reasons to further expanding the destructions. This idea will help in future to make experimentation on the hurricane. As in the future, there are two types of electricity that Direct Current (DC) electric distribution was invented by Thomas Edison and Alternating Current (AC) electric distribution that was invented by Nikola Tesla [13]. Every invention has its own advantages and its merits. A combination of both in recent life will be a new innovation as the most of the devices work with DC voltage and it is supplied with AC voltage. These can be found in medical equipment and the most of electronic devices and so further on. There is a research in the field of DC supply house that is called the smart house, but it does not cover the distribution network outside the house. Our inventions in the future will be a created DC network in the house at low voltage so it is safe and the earthing connection may not be required. E.g. transformer to reduce the voltage level, rectifier circuit and control circuit to obtain DC voltage at constant are not required, only one transformer at the main circuit breaker. However, in the outside house, the distribution networks will increase the voltage level to reduce the cost. Because, nowadays, the technology such as the Metal-Oxide-Semiconductor Field-Effect Transistor (MOSFET), an Insulated Gate Bipolar Transistor (IGBT) can help us to change DC or AC electricity in a simple way and vice versa and also changes the frequency. There are two

fundament elements that are amplitude and frequency. Nowadays, the change in amplitude and frequency through the cyclone converter can be simple. On the other hand, in the past, there is only one way to change the frequency that is from the main supply (generator). This technology did not exist during the era of Nikola Tesla or Thomas Edison. This is why we will create a new patent in this field, which will be submitted to Innovate UK next year and open the door for researchers.

## References

- [1] D. Hyndman and D. Hyndman, *Natural hazards and disasters*: Cengage Learning, 2016.
- [2] N. Agrawal, "Natural Disasters and Risk Management in Canada."
- [3] Karl Hille, (2015), How Does NASA Study Hurricanes?, NASA, available at <https://www.nasa.gov/feature/goddard/how-does-nasa-study-hurricanes> [accessed: 11/04/2018].
- [4] I. Rbough and A. A. El Imrani, "Hurricane Search algorithm a new model for function optimization," in *Information and Communication Systems (ICICS), 2014 5th International Conference on*, 2014, pp. 1-5.
- [5] M. Rostami and V. Zeitlin, "Improved moist-convective rotating shallow water model and its application to instabilities of hurricane-like vortices," *Quarterly Journal of the Royal Meteorological Society*, 2018.
- [6] J. Kotz, P. Treichel, and J. Townsend, *Chemistry and Chemical Reactivity*: Cengage Learning, 2008.
- [7] P. Walker and E. Wood, *Weather and Climate Experiments*: Facts On File, Incorporated, 2009.
- [8] L. Karafantis, "NASA's Mission Control Center: The Space Program's Capitol as Innovative Capital," in *NASA Spaceflight*, ed: Springer, 2018, pp. 129-154.
- [9] Scott Waldman, 2017, Global Warming Tied to Hurricane Harvey, *scientificamerican*, available at <https://www.scientificamerican.com/article/global-warming-tied-to-hurricane-harvey/> [accessed: 10/03/2018].
- [10] Wayne Drash, 2017, Yes, climate change made Harvey and Irma worse, CNN, available at <https://edition.cnn.com/2017/09/15/us/climate-change-hurricanes-Harvey-and-irma/index.html> [accessed: 10/02/2018].
- [11] Umair Irfan, 2017, 2 gonzo ideas for slowing down a hurricane that might actually work, VOX, available at <https://www.vox.com/energy-and-environment/2017/9/8/16264376/stopping-a-hurricane-science> [accessed: 01/02/2018].
- [12] The University of Delaware, 2014, Taming hurricanes, available at <http://www1.udel.edu/udaily/2014/feb/hurricanes-wind-turbines-022614.html> [accessed: 01/01/2018].
- [13] Y. Yang and K. Zhou, "Modeling and Control of Single-Phase AC/DC Converters," in *Control of Power Electronic Converters and Systems*, ed: Elsevier, 2018, pp. 93-115.