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New Analysis of all Seas Water Parameters for all March Months from 2005 to 2017 Using Real Time Data

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Abstract:

In this manuscript we used real time data of temperatures and salinity, for all March months vary from 2005 to 2017, this data are taken from National centers for environmental information also called National oceanic and atmospheric administration, in long-ago decades scientists used data as a hypothesis, to find marine water parameters, which is not promising in real life, because the marine water parameters, altered with each depth, latitudes and longitudes. At this catalog, the data are accessible at each depth, latitudes and longitudes of ocean, in analyzed and in statistical data form. In this paper we identified mean conductivity, mean permittivity, mean salinity and mean temperatures for all March months from 2005 to 2017, from exterior of ocean to depth of 5500 m via this real time data from National centers for environmental information. We use Mat lab as a simulation tool to come across, these ocean water parameters from this real time data. We use 2 to 40 GHz frequency of electromagnetic waves to discover these sea water parameters, we also used Ellison et al. Model 1998 and Debye interpolation function formula, as a reference formula to get these ocean water parameters, by using concrete time data from National centers for environmental information.

Keywords: mean permittivity, mean salinity, mean temperature, mean conductivity, ppt. s/m, F/m.

1. Introduction:

Sea water contains inorganic and organic compounds; organic compounds have no cause on ocean water parameters because organic compounds posses' carbon, while inorganic compounds have no constituent of carbons, which are salts dissolved in sea water, the basis of inorganic compounds are volcanoes, rain which distorted its concentrations in marine water. The marine water parameters are linked with these inorganic compound's, if the inorganic compounds' concentration are elevated, the ocean water parameters i.e. mean conductivity, mean permittivity, mean salinity and mean temperatures are elevated, and if the inorganic compound's concentration are low down, the sea water parameters i.e. mean conductivity, mean permittivity, mean salinity and mean temperatures are little. Which we discuss underneath, we use Debye model as a reference model to locate the ocean water parameters, in ancient times' scientist used Debye model for unchanging data and unchanging frequency, to discover the ocean water parameters, which is not promising in real world.

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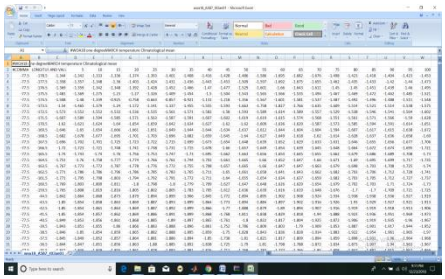
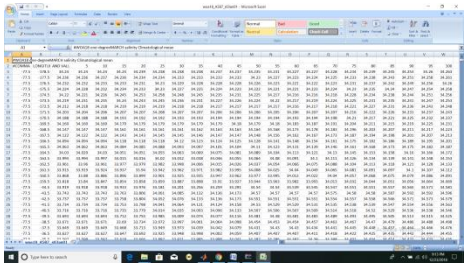
2. Real time data of salinity and temperatures of sea:

The real time data are took from National centers for environmental information in appearance of salinity and temperatures from different depths, latitudes, longitudes from all over the ocean of the world, in shape of analyzed mean data and statistical mean data as exposed below.

a) Analyzed mean data

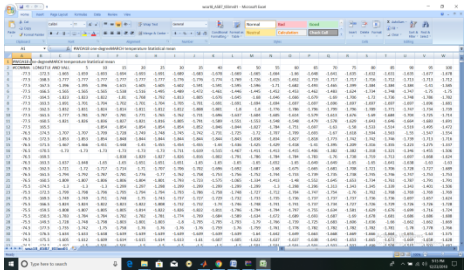


a) Fig 1 Temperature data.

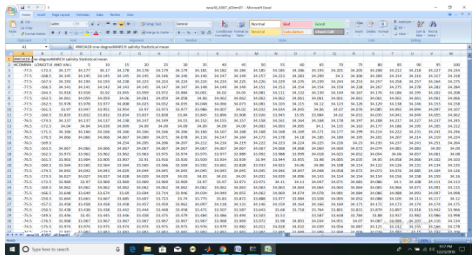


b) Fig 2 salinity data.

b) Statistical mean data:



a) Fig 3 Temperature data.



b) Fig 4 salinity data.

3. Mean salinity of sea water :

The salinity means the salts solve in marine water, it is deliberated in parts per thousand denoted by ppt. The greatest salinity concentration consists of sodium chlorides; the extra salts are calcium chlorides, magnesium chlorides, magnesium sulfate, and sodium bicarbonates. The source of salinity are volcanoes, they let go different types of chemical gases, and shape different types of salts, which flow to marine water and structure inorganic compounds, the other cause is rain, the rain cataract on salty mountains and dissimilar salts flows to ocean water. The mean salinity means that we took whole numbers of data points, from ocean water and partition by total number of data points. **[1,2,3,4].**

Simulation outcome of, Mean salinity by means of Analyzed mean data and statistical mean data of ocean water:

3. a) Mean salinity using Analyzed mean data of sea water:

We took salinity actual time data of marine water from outside of sea to depth of 5500 m from National centers for environmental information, and used Mat lab simulation code to form different results as exposed in fig 5, fig 6, fig 7, and fig 8. This legitimate time data are existing in array forms 41089*2, it shows that it's the information points of salinity, all over the globe of dissimilar seas, from surface of marine to depth of 5500 m; it is just for March months from 2005 to 2017. In fig 5 from 2 to 12 (c^o) ,the salinity concentration varies from 29.7 to 34.3 ppt. Approximately, and it shows the depth and middle of ocean water, it means that at this position, the inorganic compounds are in the lowest amount quantity, and temperatures of ocean water are also least at depth of ocean water, the salinity concentration are a function of temperatures of ocean water, so as we go further from depth and middle of ocean to exterior of ocean water, the inorganic compounds concentration and temperatures of ocean water increases as in fig 5 from 12 to 15.2 (c^o) , approximately, the salinity concentrations vary from 34.3 to 34.7 ppt. Approximately, The salinity concentrations are also a function of ocean water conductivity, as revealed in fig 6 from 29.8 to 34 ppt. Approximately, The mean conductivity ranges from 2.5 to 3.8 s/m, it shows the depth and middle of ocean water, and as we go from depth and middle of marine to outside of ocean water as exposed in fig 6 from 34 to 34.7 ppt. Approximately, the ocean water conductivity vary from 3.8 to 4.4 s/m approximately, it means at these points the marine water temperatures and salinity concentration are elevated. The fig 7 also shows that the

marine water salinity are a function of marine water permittivity real part, the real part shows that how much energy store by ocean water, the fig 7 illustrates that from 29.8 to 34 ppt. Approximately, Salinity concentrations the permittivity real part have the least value of 17.1 to 25.6 F/m approximately, and it shows the depth and middle of ocean water, at this position the ocean water temperatures, salinity concentrations and conductivity of ocean water are least, but as we travel from depth and middle of ocean water, to exterior of marine water, the permittivity real part and salinity concentrations elevated linearly in fig 7 from 34 to 34.7 ppt. The real part of permittivity ranges from 25.6 to 26.9 F/m approximately, It means that the energy stored by ocean water are utmost, at this spot the ocean water temperatures, sea water salinity concentrations and conductivity of ocean water are utmost, and it's the outside of sea water. The fig 8 shows the association of salinity concentrations and imaginary part of permittivity, in fig 8 from 29.5 to 34 ppt. Approximately, Salinity concentrations, the imaginary part of permittivity jumps from 9.8 to 16 F/m approximately, it shows the depth and middle of ocean water, it also shows that at this spot the electric field discharge the energy in the least amount, but as we go further from depth and middle of ocean to exterior of sea water as in fig 8, from 34 to 34.7 ppt. Approximately, salinity concentrations, the energy let go by electric field elevated from 16 to 16.9 F/m. It also shows that energy discharges by electric field are inversely proportional to salinity concentrations, temperatures of ocean water, conductivity of marine water.

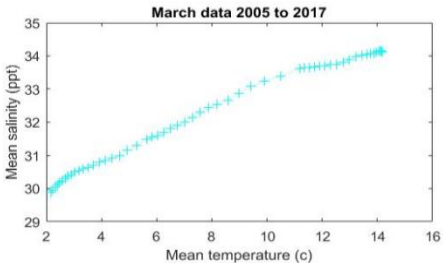


Fig 5 Mean salinity vs. mean temperature.

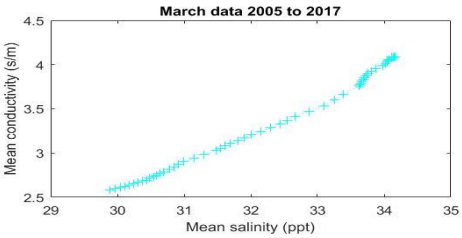


Fig 6 Mean salinity vs. mean conductivity.

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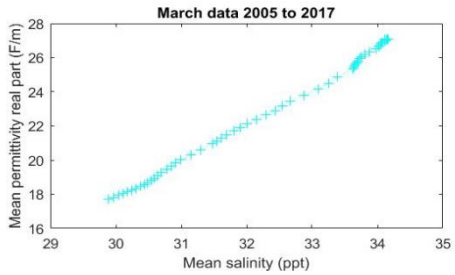

Fig 7 Mean salinity vs. Mean permittivity real part.

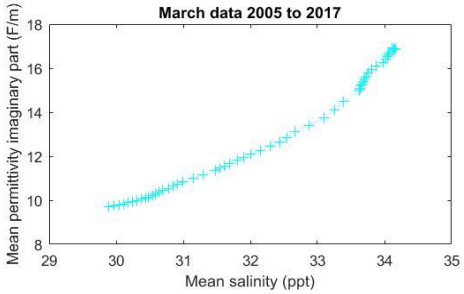

Fig 8 Mean salinity vs. mean permittivity imaginary part.

3. b) Mean salinity using Statistical mean data of sea water:

The statistical mean data means scrutinize the data statistically, we took the salinity data array of 27547*59 from National centers for environmental information, and used Mat lab simulation code to produce different fallout of salinity versus different parameters of marine water as revealed in fig 9, fig 10, fig 11, fig 12. The fig 9 shows that as we shift from depth and middle of ocean to outside of marine as in fig 9 from temperature 2.5 to 10 (c^o), the salinity concentrations vary from 28 to 33.8 ppt. But as we go further from depth and middle of ocean to outside of ocean water as in fig 9 from 10 to 18 (c^o) ,there are a minor increase in salinity concentrations and it approximately looks constant and it ranges from 33.8 to 35.2 ppt. It means that the inorganic compound's concentrations increases to some extent and at 18.7 (c^o), approximately, it drops 30 ppt. Approximately its means at this position the salinity concentrations minimizes it's an authenticity that the ocean water concentrations are not identical on the whole surface of ocean water, in long-ago the scientists thinking that the ocean water temperatures, conductivity and salinity are similar on every plane of ocean, although it is not like that it is not same. In fig 10 the salinity concentrations vary linearly with ocean water conductivity, from 28.5 to 33.1 ppt. The marine water conductivity vary from 2.5 to 3.3 s/m, it shows the depth and middle of sea water, and at depth and middle of ocean water, the salinity concentration, temperatures of marine water are bare minimum, as we go further from 33.1 to 34.7 ppt. Salinity concentrations, the conductivity of ocean water ranges from 3.3 to 4.4 s/m approximately, but at 34.7 ppt. Salinity concentrations, it falls to 3.8 s/m conductivity it means at this position some surface of ocean water have the lowest amount of salinity concentrations because, the ocean water surfaces have not regular salinity concentrations and temperatures. The conductivity is also a function of

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salinity concentrations and temperatures of ocean water. The salinity concentrations are also a function of permittivity real part as revealed in fig 11 below from 28.6 to 33 ppt. Of salinity concentrations, the real part of permittivity vary from 16 to 23.9 F/m its shows the depth and middle of ocean water, and the energy stored in electric field in marine water are lowest at this position of sea water and as we go further towards the surface of sea water the salinity concentration vary from 33 to 34.7 ppt. And the permittivity real part vary from 23.9 to 29.1 F/m approximately, and it's the surface of sea water and it shows the energy liberate by electric field are maximum. The salinity concentrations are also affects the permittivity imaginary part as exposed in fig 12 below from 28.5 to 33 ppt. Of salinity concentrations it has a minimum value of 8.8 to 12.1 F/m approximately, it shows the depth and middle of ocean water, so the energy liberate at this spot are bare minimum, as we shift further from depth of sea and middle to outside of ocean water, the energy discharge by electric field are elevated as shown in fig 12 from 33 to 34.7 ppt. The energy liberate are from 12.1 to 18.6 F/m approximately, at this spot, it also falls to 15.8 F/m its due to variations of ocean water salinity concentrations, temperatures of ocean water variations and conductivity of ocean water variations, because ocean water surface are not regular as we have already mentioned above.

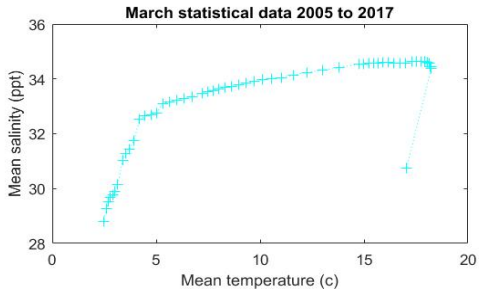

Fig 9 Mean salinity vs. mean temperature.

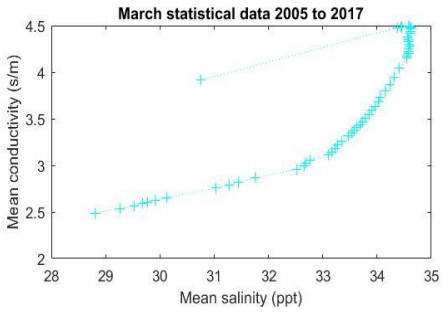

Fig 10 Mean salinity vs. mean conductivity

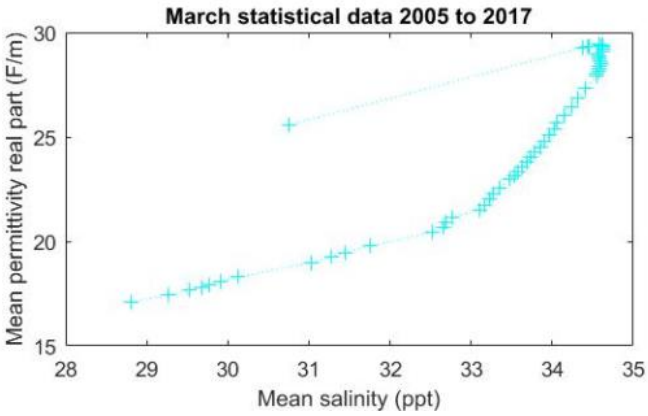

Fig 11 Mean salinity vs. mean permittivity real part.

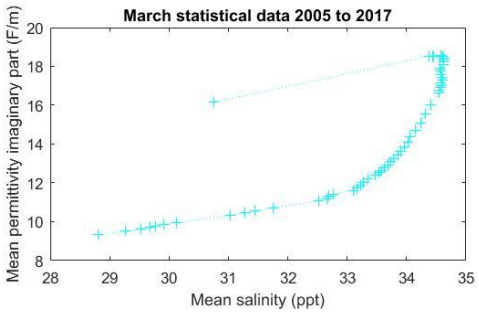

Fig 12 Mean salinity vs. mean permittivity imaginary part.

4. Mean temperature of sea water:

The temperature shows the marine water warmth or frostiness, it is deliberate in Celsius in system international denoted by (c^o). The marine water temperatures vary from -2 to 30, and at dissimilar surfaces of ocean water it varies. So the average temperature means the total number of data points of ocean water divide by the whole number. We took data points 41089*59 from National centers for environmental information, and used Mat lab simulation code to engender different results of temperatures versus different parameters of sea water as shown in fig 13, fig 14, fig 15, and fig 16. **[5,6]**

Simulation fallout of Mean temperature using Analyzed Mean data and statistical data of sea water

4: **a) Mean temperature using Analyzed mean data of sea water:**

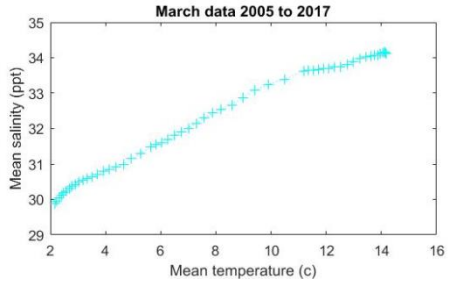

Fig 13 Mean temperature vs. mean salinity.

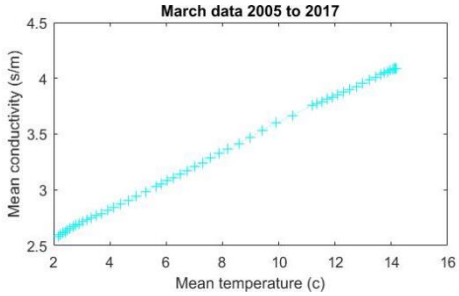

Fig 14 Mean temperature vs. mean conductivity

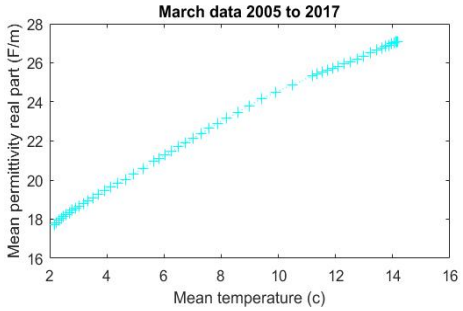

Fig 15 Mean temperature vs. mean permittivity real part

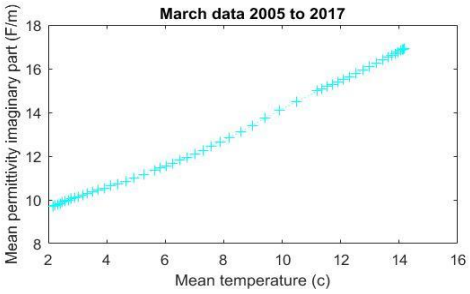

Fig 16 Mean temperature vs. mean permittivity imaginary part

The average temperatures are also depended on salinity concentrations, if the salinity concentrations are highest, the temperatures of marine water are also highest, and if the

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temperatures of ocean water are least the salinity concentrations are also least, as revealed in fig 13 from 2 to 10 (c^o), the salinity concentrations varies from 29.9 to 33 ppt. And it is the depth and mid of ocean water, but as the temperatures of marine water increases from 10 to 15.8 (c^o), the salinity concentrations vary from 33 to 34.5 ppt. It shows that as we move from depth and mid of sea to surface of sea water, the inorganic compound's concentrations ratio increases. The average temperatures are also a function of average conductivity as exposed in fig 14 from 2 to 10 (c^o), the average conductivity ranges from 2.5 to 3.6 s/m approximately and it's the depth and mid of sea water, as the average temperature increases from 10 to 15 (c^o), the conductivity of ocean water jumps from 3.6 to 4.2 s/m, approximately, and it shows that we are shifting from depth and mid of ocean to surface of sea water, at surface of ocean water, the conductivity of ocean water are utmost and temperatures and salinity concentrations are also highest, as we know salinity concentrations and temperatures of marine are the function of ocean water conductivity. The average temperatures are also dependent on permittivity real part as revealed in fig 15 from 2 to 10 (c^o), the real part of permittivity vary from 17.5 to 22.7 F/m approximately as exposed in fig 15, it shows the depth and mid of ocean water at this spot, the energy stored by electric field are bare minimum, because at this position the sea water temperatures, salinity concentrations and ocean water conductivity are least, as we go further from depth and mid of ocean to surface of marine water, the average temperature elevated from 10 to 15.3 (c^o), which yield to elevate the ocean water permittivity real part as revealed in fig 15, the real part of permittivity elevated from 22.7 to 26.9 F/m approximately. So the average temperature are also affected the ocean water permittivity imaginary part as exposed in fig 16, from 2 to 10 (c^o), it has the least value of 9.8 to 12.7F/m approximately, and from 10 to 15 (c^o), it has the highest value of 12.7 to 17.3 F/m approximately, the imaginary part shows the electric field energy liberate at depth, they are least at depth of ocean water and utmost at exterior of sea as revealed in fig 16 above.

4. b) Mean temperature using Statistical mean data of sea water:

This appraisal shows the average temperature with different ocean water parameters statistically as exposed in below figures.

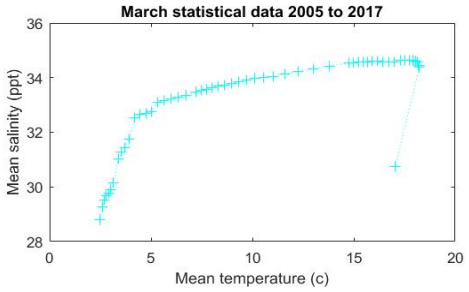

Fig 17 Mean temperature vs.Mean salinity.

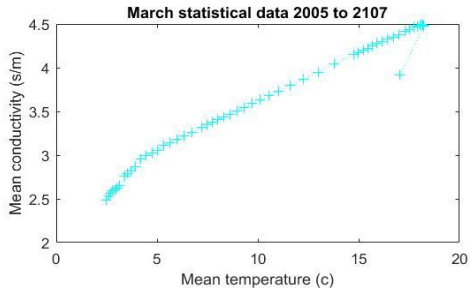

Fig 18 Mean temperature vs. mean conductivity.

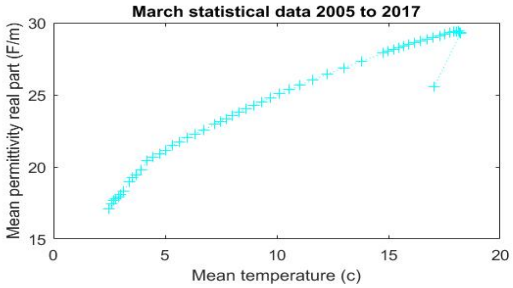

Fig 19 Mean temperature vs. mean permittivity real part

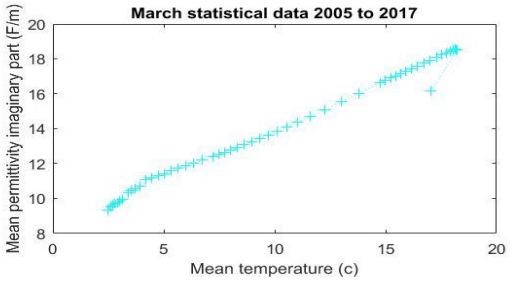

Fig 20 Mean temperature vs. mean permittivity imaginary part

The average temperatures from 2.5 to 10 (c^o), fallout in 28 to 33.8 ppt. Salinity concentrations approximately, which is the depth and mid of ocean but as the temperature elevated from 10 to 19.6 (c^o), approximately, the salinity concentrations elevated from 33.8 to 34.8 ppt. This shows we are shifting toward the exterior of ocean water as exposed in fig 17 above. The average temperature are also affected with marine water conductivity as revealed in above fig 18 from 2.5 to 10 (c^o), the ocean water conductivity vary from 2.5 to 3.4 s/m approximately, it's the depth and mid of marine as we go from depth and mid of ocean to surface of ocean, the ocean water conductivity changes from 3.4 to 4.4 s/m approximately, at temperature range of 10 to 18.8 (c^o), and it's the exterior of sea water at this position, the salinity concentrations and temperatures of ocean are utmost and average conductivity are also a function of salinity concentrations and temperatures of ocean water. The average temperature also affects the marine water permittivity real part as revealed in fig 19 above, from temperatures range of 2.5 to 10 (c^o), it has the least value of 15.9 to 23.9 F/m approximately, and it's the depth and mid of ocean, while at

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temperature 10 to 18.8 (c^o), it has the highest value of 15.9 to 29.7 F/m approximately, which is the exterior of sea water at this spot the ocean water parameters are at highest level. So the real part of permittivity shows us the energy absorbed by electric field. So the average temperatures are also affects the imaginary part of ocean water too as exposed in fig 20 above, from 2.5 to 10 (c^o), it has the least value of 8.2 to 13.9 F/m approximately, and it's the depth and mid of sea water at this period the marine water parameters have a minimum values, as we go from depth and mid of ocean to surface of sea water, the average temperature changes from 10 to 18.8 (c^o), which modify the imaginary part of ocean water permittivity from 13.9 to 19.2 F/m approximately, as exposed in above fig 20 the imaginary part of ocean water permittivity shows the energy liberate by electric field.

.5. Mean Conductivity of sea water:

The average conductivity of water permits the current to flow through marine water, it is utmost at the exterior of ocean water, due to plentiful amount of ocean water salinity concentrations and marine water the highest temperatures, while it is least at the depth of ocean water, it is calculated in Siemens per meter (s/m) in system international, and its represented by a Greek word sigma "σ ". **[7,8].**

Mathematically average conductivity

$$\sigma(s, t) = v(t) + u(t)\, s \qquad \textbf{(1)}$$

$$v(t)=0.086374+.030606t-.0004121t^2$$
$$u(t)=0.077454+.001687t+.00001937\, t^2$$

Where in equation (1) "v(t)" is coefficient of time, and "u(t)" are coefficient of salinity.

Simulation fallout of average conductivity using Analyzed Mean data and statistical data of sea water:

4 a) Mean conductivity using Analyzed mean data of sea water:

In this segment we compared the average conductivity versus different ocean water parameters as exposed in fig 21, fig 22, fig 23, and fig 24 as shown below.

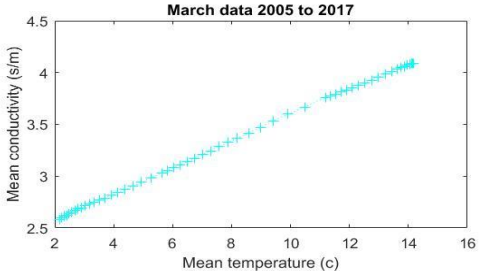

Fig 21 Mean temperature vs. mean conductivity

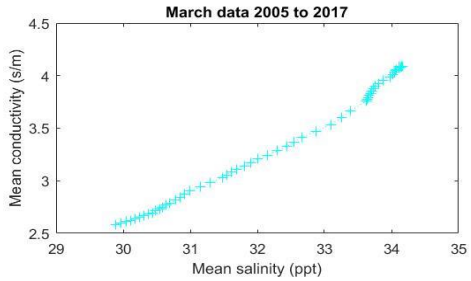

Fig 22 Mean conductivity vs. mean salinity

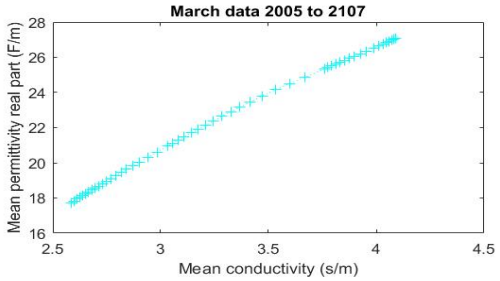

Fig 23 Mean conductivity vs. mean permittivity real part

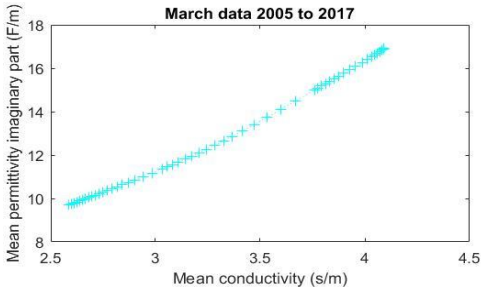

Fig 24 Mean conductivity vs. mean permittivity imaginary part

The average conductivity are a function of average temperatures as revealed in fig 21 from 2 to 10 (c^o), the average conductivity ranges from 2.5 to 3.7 s/m approximately, as exposed in fig 21 above and it's the depth and mid of ocean water, at this stage the marine water temperatures and marine water salinity concentrations are lowest, but as we go from depth of ocean to exterior of ocean water at average temperature 10 to 14.6 (c^o), approximately, the ocean water average conductivity changes from 3.7 to 4.3 s/m approximately, and it's the surface of ocean water, and at this period, the ocean water temperatures and ocean water salinity concentrations are utmost. The average conductivity are also a function of mean salinity as revealed in fig 22 above, from 29.7 to 33 ppt. Salinity concentrations, the average conductivity has the least value of 2.5 to 3.6s/m approximately as exposed in above fig 22, and it's the depth and mid of marine water as we recognize at this stage the inorganic compounds and temperatures of marine have a bare minimum value, so the average conductivity are also the function of ocean water salinity concentrations and temperatures of ocean water, it also affected but as we go further from depth

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and mid of ocean to surface of ocean water, the salinity concentrations tainted to its highest level as shown in fig 22 above, from 33 to 34.6 ppt. The average conductivity vary from 3.6 to 4.2 s/m approximately, as revealed in above fig 22. The average conductivity are also affected the average permittivity real part as shown in fig 23, from 2.5 to 3.5 s/m average conductivity it has the least value of 17 to 23.2 F/m approximately, as exposed in above fig 23 and it's the depth and mid of ocean water, at this point the ocean water salinity concentrations, temperatures of ocean and average conductivity of ocean water have the least values, so the real part of permittivity have also the least values and the energy stored by electric field have the least values as exposed in above fig 23. But as we go further to exterior of ocean water, the real part of permittivity of marine water have the highest values, and the average conductivity values also vary as revealed in fig 23 from 3.5 to 4.2 s/m, it's values varies to 23.2 to 27.1 F/m approximately, and it's the exterior of ocean water it shows that the electric field stored the energy at this position are utmost, and it also shows that salinity concentrations, marine water temperatures and ocean water conductivity are also highest at this spot. The average conductivity also affects the imaginary part of ocean water permittivity as revealed in fig 24, from 2.5 to 3.5 s/m, it has the bare minimum value of 9 to 13.1 F/m, and it the depth and mid of ocean water at this phase the energy liberate by electric field are least as we shift to exterior of ocean water the energy liberate by electric field are utmost, and it's vary to 13.1 to 17.4 F/m approximately, at average conductivity of 3.5 to 4.3 s/m, and it's the surface of ocean water.

5. b) Mean conductivity using Statistical mean data of sea water:

In this study we calculated ocean water parameters statistically as revealed in below figures.

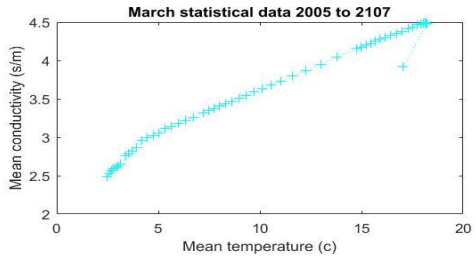

Fig 25 Mean temperature vs. mean conductivity

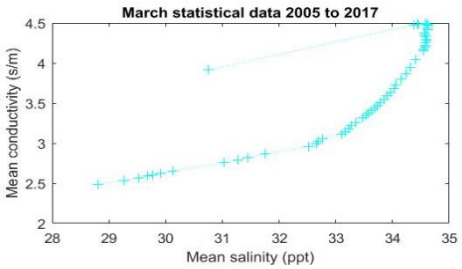

Fig 26 Mean conductivity vs. mean salinity

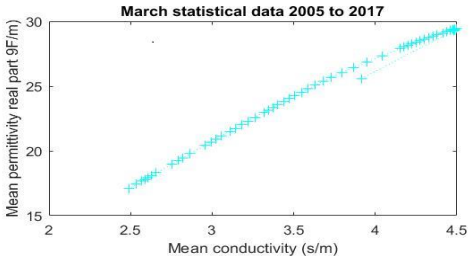

Fig 27 Mean conductivity vs. mean permittivity real part

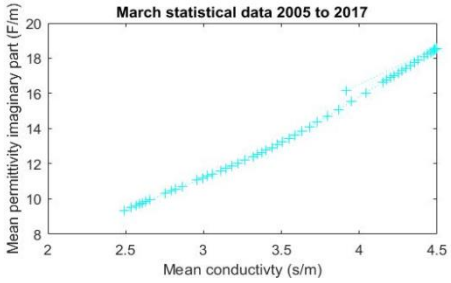

Fig 28 Mean conductivity vs. mean permittivity imaginary part

The average conductivity affects the average temperatures linearly as exposed in fig 25 from 2.5 to 10 (c0), the average conductivity ranges from 2.5 to 3.6 s/m approximately, and it's the depth and mid of ocean water and as we shift to toward surface of ocean water the conductivity vary from 3.6 to 4.5 s/m approximately, at temperatures range of 10 to 18.8 (c^0) as revealed in fig 25, and it's the exterior of ocean water, at exterior of ocean water the salinity concentrations and temperatures are utmost, that's why the average conductivity are utmost as shown in fig 25. The average conductivity also affects the average salinity as exposed in fig 26, from 28 to 33 ppt. It has the least value of 2.5 to 3.2 s/m, and it's the depth and mid of ocean water, and it has the highest value of 3.2 to 4.5 s/m approximately, at salinity concentrations of 33 to 34.7 ppt. As revealed in fig 26 but it falls to 3.9 s/m average conductivity at 34.7 ppt. Salinity concentrations, it shows that the ocean water salinity concentrations and average temperatures are not regular at some surfaces of marine water. The average conductivity are also affected the average permittivity real part in this examination as revealed in fig 27, it is least at depth of ocean as exposed in fig 27, from 2.5 to 3.5 s/m it has the lowest value of 16 to 24.5 F/m and it's the depth and mid of ocean water, at this phase energy stored by electric field are bare minimum and all the ocean water parameters have a bare minimum values, and as we go from depth of ocean to exterior of marine water, the energy stored by electric field elevated from 24.5 to 29.9 F/m approximately, at average conductivity from 3.5 to 4.5 s/m approximately, as revealed in fig 27 and it's the surface of ocean water, at this phase the ocean water parameters have an utmost values. In this investigation the sea water average conductivity are also affects the imaginary part of ocean water permittivity as exposed in fig 28, at depth of ocean it has the least values from 8 to 13.7F/m approximately, at average conductivity range of 2.5 to 3.5 s/m, and it has the maximum value of 13.7 to 18.5 F/m approximately, at average conductivity range of 3.5 to 4.5

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s/m, and it's the surface of ocean water as revealed in fig 28, at this phase the energy liberate by electric field are utmost.

6. Mean Permittivity of sea water:

Average permittivity of ocean water is the capability of marine water to amass energy in its electric field in system international it's denoted by Farad per meter represented by a symbol F/m. **[9,10].**

Mathematically

$$\varepsilon = \varepsilon_r \varepsilon_o \qquad \textbf{(2)}$$

Wherever "ε_r" is the relative permittivity of a material and "ε_o" is the vacuum permittivity of free space having a assessment of 8.85*10^-12 F/m.

We apply Debye interpolation function to locate average permittivity from average conductivity, average temperatures and mean salinity via real time data, from National centers for environmental information in shape of salinity and temperatures, and we place this data in interpolation function, and we can compute different ocean water parameters the equation is revealed below.

Debye interpolation function

Mathematically

$$\varepsilon(t, s, v) = \varepsilon_\infty + \varepsilon_o \_ \varepsilon_\infty / 1\text{-}j2\pi\tau v + j\,\sigma / 2\pi v\, \varepsilon^* \qquad \textbf{(3)}$$

wherever in equation (3) "ε" is the permittivity of marine water, and "ε_∞, ε_o" are the static and frequency dielectric constants depends on temperatures of ocean and salinity of ocean water while "σ, v" are average conductivity of ocean water and angular frequency of ocean water and "τ, ε^*" are the relaxation time and the permittivity of free space. We employed Mat lab simulation tool and used equation (3) on actual time data, we can analyze the average permittivity of marine water as revealed in above figures, on analyzed mean data and on statistical mean data.

7. Conclusion :

We acknowledged that average conductivity and average permittivity of March months from 2005 to 2017 are the function of ocean water salinity concentrations, and temperatures of ocean water, if the salinity concentrations and temperatures of ocean water are elevated, the average conductivity and the average permittivity of ocean water are also elevated, and if the ocean water temperatures and salinity concentrations are stumpy, the average conductivity and average permittivity are stumpy, which we recognized in this article.

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8. Future work:

This technique can also be used in the future, if we have actual time data from National centers for environmental information accessible for more than 1500 m depths of marine, for all March months, and we can simply locate ocean water parameters.

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