

# THE MECHANISM BEHIND OCEANIC TIDES

There are lots of misinterpretations about formation of tides in oceans due to positioning of Moon in the sky.

I am writing this paper for those who are of **alternative thinking, open minded** and often questioning everything bravely in the open global knowledge platform 'QUORA' for seeking of new advancements in the subject fields of Physics.

First of all we have got to understand that;

- Earth is moving around Sun in an orbit of nearly circular shape.
- Moon is orbiting Earth while the couple is in an orbit around Sun.
- Moon Gravity at Earth=  $0.003\text{cm/s}^2$ .
- Sun's Gravity at Earth=  $0.592\text{cm/s}^2$ .
- There are two types of oceanic tides such as 1)-Spring Tide & 2)-Neap Tides.

## What is Neap Tide?

**Neap Tides** which occur at the 1st quarter and 3rd quarter positions of Moon orbit is easy to understand by students because the **half Moon** is then visible just above the ocean. The culprit who make the tide is also so clear as Moon, because Sun is far away at right angles at such situations.

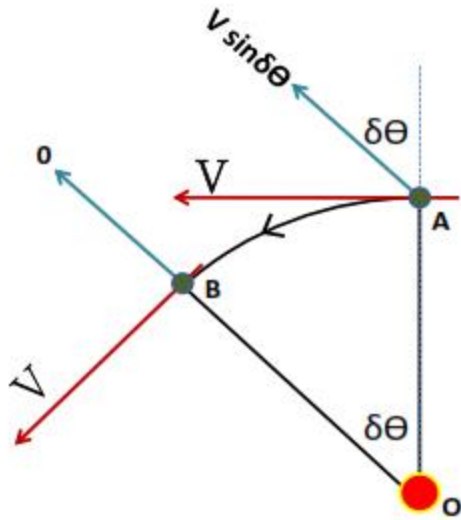
## What is Spring Tide?

**Spring Tides** are not well explained in the background science and solar gravity has no additional function there in oceans to make tides because Sun has already done his duty by balancing the entire mass of Earth in the orbital dynamics.

Sun's gravitational force ( $\mathbf{kM/d^2}$ ) is well balanced by the centrifugal force on Earth( $\mathbf{mV^2/d}$ ) due to angular motion.

Generally students understand the **Gravitational Attraction** as Sir Isaac Newton had explained it theoretically and practically as well by the 17th century as;  $\mathbf{Gf = k m M/d^2}$  .....where; **k**-gravitational constant, **m**-mass of the object, **M**-mass of the source & **d**-distance to the source.

But most of them don't know what **Centrifugal Force** is. In the layman's words, It is just the thrust by which you are pushed away when your car is taking a bend. It's theoretical derivation is as shown below;



## Centrifugal force

Let's analyze any two close consequent positions, A & B, in the curvilinear motion of the planet. In the direction of OB, initial momentum is ' $m \times V \sin \delta\theta$ ' and after time ' $\delta t$ ' it becomes zero. That indicates the influence of a force to divert away the initial mass motion from OB direction.

Impulsive force = change of momentum/time  
 $F_c = (m \times V \sin \delta\theta - 0) / \delta t$

(Where ' $\delta\theta$ ' is small,  $\sin \delta\theta \approx \delta\theta$ ) i.e.  
 $F_c = m \times V \delta\theta / \delta t$

(Angular velocity;  $\omega = \delta\theta / \delta t = V/R$ ) i.e.  
 $F_c = m \times V (V/R) = mV^2/R$

$$\underline{F_c = mV^2/R}$$

$m$  - mass of the planet  
 $V$  - orbital velocity of the planet  
 $\delta\theta$  - a small angle of rotation  
 $R$  - distance to Sun

Spring tides are described by different scholars in many different ways.

- Some scientists say that, Earth's body is bulged in an ellipsoidal way due to the drag of solar gravity in line of interconnectivity and hence the spring waves are created. But we cannot believe that theory because if such a bulking and shrinkage of the Globe, to happen every day, it should have definitely racked the Great Wall of China.
- Also some people say that, it is Sun's gravity. But I don't accept it at all, because how could then it happen every day in the other side of the Globe too, at the same time in the mid night?

### Why doesn't Sun affect Tide?

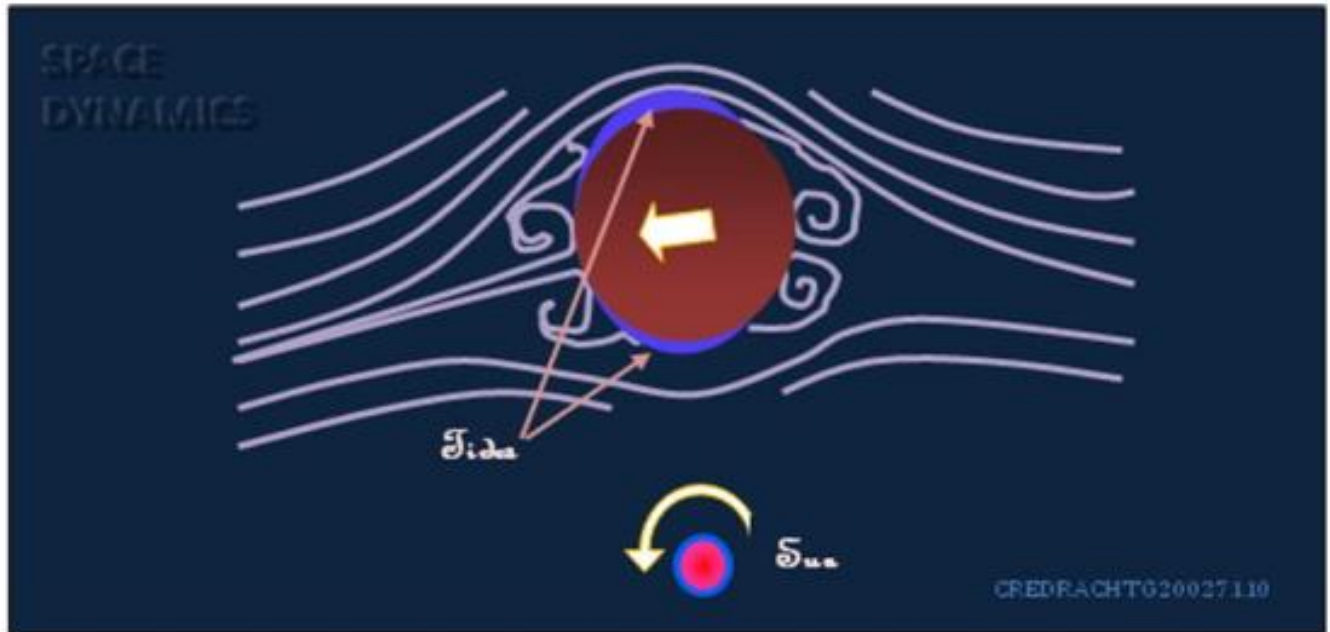
I am telling herein that, **Sun** has no role there at all to play, in occurrence of oceanic tides. That is mainly because even a single drop of water or a single atom on Earth, is at **dynamic balance** of the two forces; **gravitational drag** of Sun and **centrifugal force** away from Sun.

In spite of the position of Sun, either **closer** or **far**, all the individual body masses on Earth, are in that **dynamic stability**. Therefore no tides could be occurred by effect of solar gravity.

But the effect by Moon gravity is welcomed and accepted upon the stability of each **drop of water** in the ocean or any atom, because Earth is not in an orbital motion around Moon. In other words Moon's **Gravitational Attraction** is not balanced by any other repulsive force. Even though it is very small on Earth, Moon can collect water to make a **water mountain** towards Moon in the sea.

## Then how could both-end globe tides(Spring Tides) could take place in Oceans?

I don't agree also with the term 'Spring' because this phenomenon has no direct relation with the climatic springs.

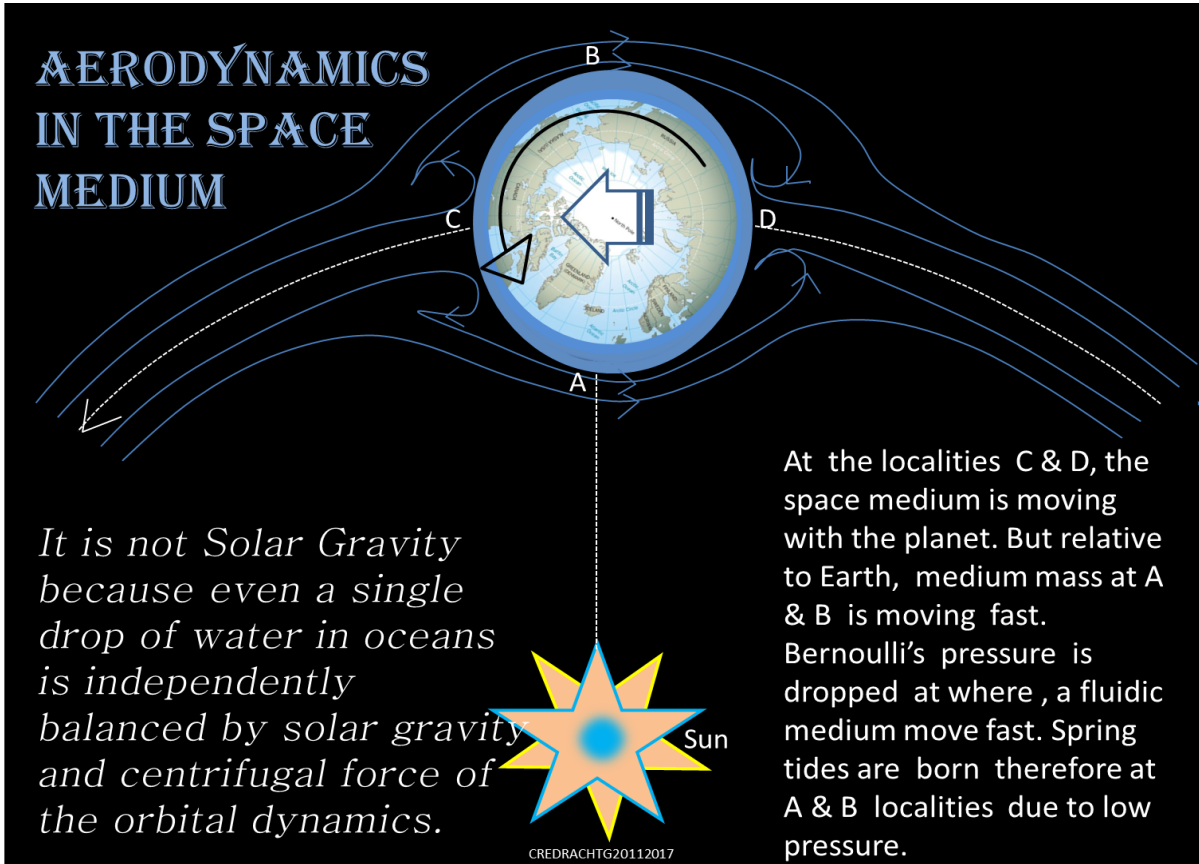


I dare say that, the natural phenomenon behind formation of spring tide is not well explained in the background science as yet. Therefore an alternative theory which is not so complicated but entirely based on the **Bernoulli's** principle of fluid dynamics is suggested herein.

“Both end globe tides (spring tides), in orbital motion of Earth about Sun, occur by the ‘**medium pressure drop**’ due to **Vacuum fluid dynamics**”

But I am facing again the biggest problem to explain the spring tide phenomenon upon **Bernoulli** principle based **aerodynamics** because the Scientists, even today by the **21<sup>st</sup> century**, don't believe that the **free space(Vacuum)** is a **Medium**. How do I explain that the **Vacuum** is a transparent medium with a **density** and a **pressure**? [I have mathematically derived its Density =  $0.002 \text{ g/cm}^3$ ), Pressure =  $9 \times 10^{17} \text{ dynes/cm}^2$ ]

However I think, this particular subject matter on ‘formation of spring tides at both end surfaces of the Globe’ shall set a solid proof for existence of the particular ‘Space Medium’ of matter, by name of **VACUUM**.



As shown in the picture, Earth is moving very fast ( $v = 29.8 \text{ x km/s}$ ) through the free space medium, in its orbital motion around Sun. Then the aerodynamics of the **space medium** creates low pressure at both topmost and bottommost surfaces on the globe. Water is heaped into the low-pressure zone and Spring Tides are created so on. At the same time, the alternative theory explains how could the far side tide on the Globe is bigger than the closer side tide due to the difference of the moving velocity against the still Vacuum Medium.

The wise reader would understand that, though Sun's gravity is so bigger than Moon's gravity, Sun doesn't make any difference in us like Moon, because it's well balanced by the orbital motion of Earth around Sun. But Moon's gravity makes a difference in our weight, even though it is so small, because we are not orbiting around Moon. [Therefore I suggest herein for the Athletes of weight lifting, to set their tittle either in full-moon or blue moon day, mid noon in order to have Moon in their support.]

---Cyril H Thalpe Gamage---

Reference-1: Properties of the Vacuum/2018 <http://www.cyrilhtgamage.com/index.php/publication-space-dynamic/87-space-dynamic/175-the-dynamic-model-of-atom>

Reference-2: Orbital dynamics of Moon/2009 <http://www.cyrilhtgamage.com/index.php/publication-space-dynamic/87-space-dynamic/135-publication-3>