

# A Macroscopic Mechanical-Force From the Quantum Vacuum

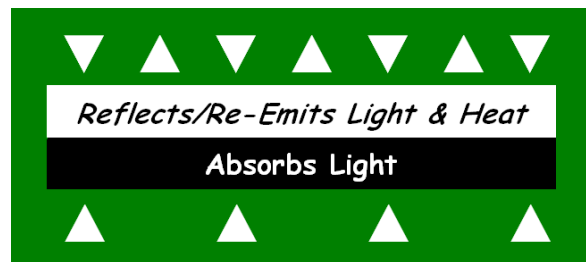
There is no new Science here. LPD is *merely* an **engineering improvement** on **Nichols** Radiometer which has existed for nearly a century. (**Not** to be confused with **Crookes** Radiometer!) LPD, like Nichols Radiometer responds to Light-Pressure, a well-known, experimentally-verified, well-understood phenomenon that has been published in *many* Prestigious, Professional, Peer-Reviewed Scientific Journals and standard textbooks world-wide. Light pressure is *vanishingly-small* in the *visible* spectrum, but is **tremendously** powerful in the Extreme Ultraviolet Spectrum (EUV). So where can we find a strong natural source of EUV???

The Zero-Point Energy (ZPE) Power Grid surrounds us *all of the time*. It is *everywhere*, even in the vacuum of Space. LPD is a simple method of connecting to this Power Grid anytime, any place without having to pay anyone, *anything, ever!!!* It is **made** of countless units of light called photons. These photons pop into our Space and Time, then pop out again! Nobody *really* knows where they come from or where they go. We do not see them because **the vast majority of these photons have wavelengths that are in the EUV range** of the electromagnetic spectrum and higher and our eyes cannot see these wavelengths.

There are so *many* of these photons that they exert *many tons* of pressure on us all of the time, everywhere we go; we generally ignore the ZPE pressure just as we generally ignore the *ten tons* of **air** pressure that pushes on *each* of our bodies, continuously, all of the time. For example, consider the plate in the illustration below; note how the ZPE forces are pushing just as strongly on each side, *but in opposite directions!*



Why is it that we don't usually notice such *powerful*, equally-balanced forces that push against each other in opposite directions? These equal **and** opposite forces are said to “cancel” one another (even though both forces are still *fully* present!) What we really mean by this word “cancel” is this: A given force can only do just so much; whenever, opposite forces are equally strong, this means that *each* force is completely devoted to *just keeping the other force from affecting anything else*. In other words, there is no **extra left-over** force to cause anything to move in any particular direction, **nor** is there any **extra** force to **prevent** anything from moving. To all **appearances** both forces **seem** to vanish.



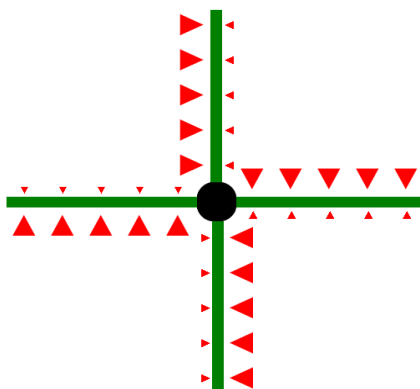
Like Nichols Radiometer, LPD (shown above) mostly absorbs EUV on one side of a plate, but mostly reflects and/or re-emits the same wavelengths from its opposite side; therefore, the ZPE will push twice as hard on the reflective/re-emissive side as on the absorptive side.

In the illustration below, note how the ZPE pushes **up** on the plate harder than it pushes **down** on the plate. The red forces that try to push the green plate upwards are much **stronger** than the red forces that try to push the plate downwards, so the plate moves upwards, in the direction that the stronger arrows are pushing it.

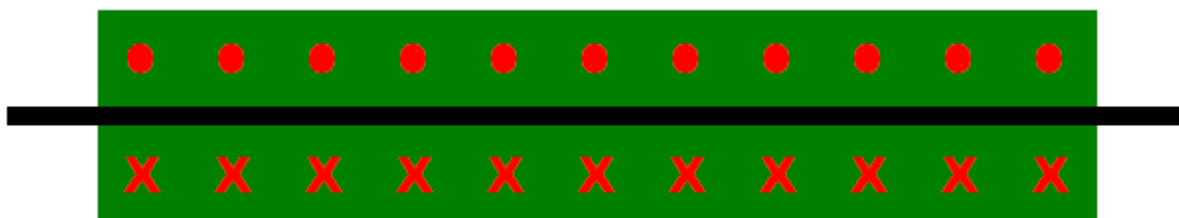


## A Simple ZPE Motor

Suppose we want to use the ZPE to power a motor: There will be a series of these plates. As before, each plate will experience a constant **net** pressure from the ZPE. In the illustrations below, four green plates are mounted on a black axle. We are looking at the **edges of the green plates** and at the **end of the axle**. The **end** of the axle appears as a black circle at the intersection of the plates. The axle will of course rotate clockwise, powered by EUV ZPE Light-Pressure.



In the illustration below, we are looking at the Side-View. The **dots** represent the **point** of the **▲**'s. These dots indicate that the ZPE force is pushing on the top plate, making it rotate directly toward you, up out of the page as the shaft turns! Likewise, the **X's** represent the **tails** of the **▲**'s. They indicate that the Light-Pressure is pushing on the bottom plate so that it is rotating away from you, **back into the page**.



This sort of arrangement can replace virtually any kind of rotating motor in any application. For example, it can be connected so that it turns an ordinary electrical generator to generate electricity.

When we improve the technology enough to exploit the more energetic 1-15nm wavelengths of the ZPE. Then we will actually mount a pair of these plates that are the size of a postage stamp, onto the frame of the car and **directly** push the car (or lift the car to make it fly!) I do **not** mean transmitting a force through some sort of drive train; instead, I mean that the ZPE will push on the plates and the plates will push **directly** on the vehicle (like when you run out of gas—you **push** on the car.)

The net force from a pair of plates can be vectored, to throttle their net force-magnitude and to alter the **direction** of their combined net force. We vector the net force by turning the plates in different directions. When they both face the same way, then their combined *net* force is at maximum. When they face opposite directions their individual net forces cancel out and there *is no net force*. Thus , we can vary them to any power setting from zero to maximum and point them in any direction.

Once we have chips that are powerful enough to lift a spacecraft, we can go anywhere whatsoever, while enjoying a constant one-g acceleration. In other words, because the ship is *constantly* accelerating at 9.81 meters per second <sup>2</sup>, the occupants experience a gravity-like force. (I am **NOT** claiming to cause true gravitational attractive or forces or anti-gravity repulsive forces!)

This works out to Earth-Mars transit times of a week to ten days, each way. People could commute daily, to and from any point on Earth in less than 45 minutes. The outer Solar System is accessible on modestly increased time-scales.

Round-Trips to the nearest few Stars could be accomplished in decades instead of millennia, or even sooner if we can exploit some of the relativistic effects that are thought to occur in these cavities. (There is some evidence that Space-time is dramatically altered inside the cavities and possibly in the immediate vicinity, just outside the cavities.)

Really, once one gets a hold of the concept of how very **powerful** the net mechanical force on these plates can be, one can imagine endless possibilities!

We *already* have the sort of technology needed to mass-produce LPD in much the same way we now mass-produce microprocessor chips that are far more complex. There are a variety of other nano-structuring techniques that can also be used to implement the inexpensive manufacture of chips that will produce dramatic forces!

Flying cars will automatically follow a virtual map that will define what speed and direction vehicles must be traveling in for every location in the sky. Simple radar will keep adjacent vehicles properly spaced.

- Users will only need to input their desired destination!
- We will travel between any two points on Earth in 90 minutes or less, including the time to navigate the much slower local traffic patterns.
- Automated delivery modules will deliver online-goods, factory-direct to our homes in hours, not days.

***This means REALLY--FREE ENERGY*** since consumers will be purchasing *home generators* and *new cars* with only ***part*** of the money they already were ***already*** spending on never-ending fuel and electric bills!

- Free energy means really cheap desalination for inexpensive irrigation wherever more water is needed!

Luxurious Spaceships will carry passengers throughout the Solar System and beyond.

- Lifting massive shielding to protect from harmful Space radiation will be no obstacle.
- By continuously accelerating or decelerating at one-g, these ships will simulate Earth's gravity in Space!

- One-g transit-times between Earth and Mars will vary between a week and ten days.
- Journeys to *nearby* stars will be accomplished in decades instead of millennia (though certainly not by casual vacationers! )
- Many ordinary people will commute to work, *both ways* between Earth and its Moon, *every day!*
- *Much ecologically harmful mining will soon be inexpensively done in Space.*

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