

SELF-SUSTAINED ELECTROMAGNETIC PROPULSION

(or 'How to generate mechanical momentum from enclosed electromagnetic energy only'). (Patent Pending).

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According to Ref.1 and others, it is not possible to create mechanical momentum from enclosed electromagnetic energy only : 'For it is an obvious postulate that in stationary state in which matter is at rest and in which there are no waves escaping, there can be no electromagnetic momentum'.

Still, this should be possible, and simpler than originally thought of :

Suppose a Helmholtz coils arrangement, i.e. two flat coils, separated a distance approximately equal to the radius of a coil.

If an alternating current is applied on each coil, an electromagnetic field will be generated by each one. So, an attraction and repulsion effect will appear at the frequency of the applied currents and fields, on each coil, due to the field generated by the other coil.

Now, the question arises: is it possible that, instead of the coils attracting and repelling each other, both will experiment a force in the same direction? In other words: if you mount them on a cart, will the cart move in one direction ?

Apparently it is possible after all, at least theoretically, because it is not the current but the FIELD generated by the said current that reacts with the other coil, and, since it takes a certain amount of time for the field to cross the space between the coils, it is just a matter of finding an arrangement that will create a unidirectional force condition.

Is there such a force condition ? Yes, and it is very simple :

If, (a) the frequency is sufficiently high so that the distance 'D' between the coils will be a quarter of a wavelength, (b) both fields are of the same frequency, and (c) are in phase when they meet at one coil (they will be in opposite phase when they reach the second coil), then, a force will appear alternating on each coil but this force will always point in the same direction, since, one of the coils (the leading one) will always be 'pushed' by the field of the lagging one, which in turn will always be 'pulled' by the leading coil field.

For clarity, see the following chart that corresponds to the schematic further down :

	FIELD	FIELD	FIELD	FIELD	DIREC.	FORCE
Time	COIL1	COIL1	COIL2	COIL2	OF	ON
	POS.1	POS.2	POS.1	POS.2	FORCE	COIL #

$$\begin{aligned} \text{coil 1 :} & \quad H_1 = I_1 \sin \omega t \\ \text{coil 2 :} & \quad H_2 = I_2 \cos \omega t \end{aligned}$$

$$\text{distance :} \quad c/4f = \lambda/4 \quad ; \text{ i.e. quarter-wavelength}$$

$$\text{Field H1 at coil 2:} \quad H_{12} = I_1 \sin(\omega t - \lambda/4) = I_1 (-\cos \omega t)$$

$$\text{Force at coil 2} \quad F_2 = \mu H_{12} * H_2 = -\mu I_1 I_2 \cos \omega t$$

This expression says that coil2 will always feel attracted, or pulled by coil 1.

$$\text{Field H2 at coil 1:} \quad H_{21} = -I_2 \cos(\omega t - \lambda/4) = -I_2 \sin \omega t$$

is negative because it travels in the opposite direction.

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$$\text{Force at coil 1 :} \quad F_1 = \mu H_1 * H_{21} = -\mu I_1 I_2 \sin \omega t$$

I.e.: coil1 always feels repelled, or pushed, by coil2. Ergo, a unidirectional force ! To concentrate the field and avoid magnetic lines dispersion, a core or nucleus of magnetic material can be used to improve the force effect. The magnetic material will then slow down the propagation of the magnetic field waves, therefore allowing to decrease, either the frequency or the distance between coils. This core behaves very much like a 'resonant cavity' also. For enclosed electromagnetic fields, the electromagnetic force equation in integral form can be used (Ref.2). The magnitude of the forces involved is very small, therefore it is difficult to set up an experiment that will demonstrate the principle, since very high frequencies and fields are necessary. For two coils mounted on a ferrite antenna core, with a relative permeability of 10, separated 6 cm, 28.2 ampturn at 395 MHZ and 156 ohms/turn are needed to generate 1 Newton ! This is 124 kVA ! plus losses. But, according to the 'Principle of Equivalence' if it is possible to create a force, in space, from enclosed electromagnetic energy only, it should be possible to create the inverse, i.e. electromagnetic energy from a 'force field'. In a previous work by this author (Ref.3), it was suggested that the 'electromagnetic momentum density' was the (missing) link between mechanics and electrodynamics. This would suggest in turn, that gravitation is nothing else than 'phase waves', similar to the ones that develop in microwave guides and resonant cavities. But for 'phase waves' to exist, there must be an electromagnetic field of that frequency present already. This, in turn, brings back the concept of 'ether', and that all mass, and even the whole universe is probably nothing else but a gigantic 'resonant cavity'. A very powerful concept. In (4) it is claimed, that an experiment has been set-up that can measure absolute velocities, and explains why the Michelson- Morley experiment fails to do so. This, in turn, would be complementary proof of the above, the existence of an 'ether'.

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