

MUFON Reports

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Lift

MUFON Advanced Technology Establishment Newport Beach, California

ABSTRACT

Lift is defined as the force or forces that permit a vehicle to hover or remain at constant altitude in flight, without expelling fluids as with a jet engine or rocket, which would be the subject of propulsion. We examine five ways that lift can be generated on our planet and have concluded that the use of the magnetic field of the earth for propelling vehicles using superconductors has merit. In addition, the study of superconductor materials and properties is a very attractive next step towards identifying the experiments having the potential of achieving gravity control.

Ways to generate lift: technical approach and concepts

A. For planets that have an atmosphere, it is possible to generate lift in three ways:

1. By displacing the atmosphere with an object. For a balloon in air, lift is the upward force equal to the weight of the air displaced. If the balloon is filled with a gas that weighs less than the air displaced, there will be a net upward force. The famous rash of sightings from the late 1890's, recently reported on by 1843(a)(2) at the Society for Scientific Exploration annual meeting in 2008, noted large numbers of airship reports having the characteristics of lighter than air balloons. Today it seems that balloon technology is well understood and the rewards from pursuing these technologies are not of the breakthrough sort.
2. If a vehicle is made to move through the air (perhaps by using a propeller or jet), lift is the component of aerodynamic force perpendicular to the motion direction. For an airplane flying steadily horizontally, this force exactly balances the force of gravity. The technology of airplanes is constantly pushed by the Government and many corporations. We see promising ideas emerging, such as those using digital simulation of fluid flows. They will get better and better but it's not unique nor does it have breakthrough potential. There is little evidence of anomalous reports of aliens in airplanes.
3. If a propeller shape is used, the axis can be made vertical and the blades push the air down, causing the vehicle to be suspended. Vertical takeoff or landing (VTOL) is a bit more interesting. For a helicopter, the blades are long and thin. Rotating blades inside a duct is the same principle but may offer advantages for noise, safety and fuel efficiency, leading one to consider ducted fans. Ducted fan designs may offer considerable advantage over helicopters. For UFOs, there are numerous reports of hovering craft. Unfortunately, the vast majority of them make little or no noise other than a humming sound, which suggests they do not move air around to stay afloat, since rapid air motion

always makes a lot of noise. The extensive reports of hovering craft of varied shapes and sizes strongly suggest that they are using technologies beyond our current skills. One would think it not unreasonable that the propulsion systems that got them here would also permit them to hover easily, especially if they involve gravity control

B. The possibility of using the earth's magnetic field has been suggested, and is scientifically not a problem. For planets that have a permanent magnetic field locally of size B , it is possible to create a magnetic dipole of strength M , providing a force on the dipole that is given by $F=M*\text{grad}B$, and the orientation of the force depends both on the direction of the gradient of the field and the direction of the axis of the dipole. The torque on such a dipole is vector $M \times B$. For the torque to be zero, the axis direction to have a vertical force depends primarily on the latitude. If the dipole were made, for example, by a superconducting toroid, a misalignment of torque would have the tendency to turn it upside down and suck it right into the earth. However, if the toroid were spinning, the gyroscopic effects would counteract this tendency, resulting in a wobbling motion. If some of the craft used toroidal superconductors to get a large magnetic moment, and spinning to avoid instability, the kind of motions one might expect would possibly be the "falling leaf" or that of a conical rotation. These have been observed, perhaps more in the past than recently, and can be easily explained as a gyroscopic response. There have been several reliable reports of compass disturbances associated with UFO flyovers, strongly suggesting large magnetic fields involved.

C. It is not thought that planets have a net charge, and therefore they have no net electrostatic field. However, planets with atmospheres may have many local weather disturbances, resulting in charge exchange, which we call lighting. Interestingly, even on a clear day at sea level, there is an electric field on earth of the order of a hundred volts/meter. This is useful for floating objects in the field (just like Millikan floated his oil drop to measure the charge on an electron) only if the field strength does not exceed the corona discharge breakdown of the order of 100,000 volts/meter. Any object with a large charge in the atmosphere would be expected to show signs of ionization of some of the atmospheric molecules close to the vehicle where the field strength would be largest, probably resulting in colored lights near anomalous craft. The idea of charging an entire craft to levitate in the earth's electric field is fundamentally sound, and would take high voltage generators to get the energy to discharge the ions or electrons, whichever is needed. The expected observables would be various kinds of colors of glow close to the vehicle where the electric field strength is large, caused by the mild ionization of a variety of the molecules found in air. However, knowledge of the electric field strength at all times would seem necessary and it would be the equivalent of constantly flying in the optimum direction in a thunderstorm. The technology issues would revolve around light weight and reliable high voltage generators available to eject either positive or negative charge as required. There might be a possibility of using the electrostatic field at the same time as the magnetic field of the earth if the high magnetic field associated with the dipole would keep the charge from leaking off the craft.

Prospects for research payoff

Toroidal Magnet Craft

The development of craft that use the Earth's magnetic field for repulsion and therefore lift is an interesting challenge. The intense magnetic field required to make it work would probably favor an unmanned vehicle, unless internal magnetic shielding could be used to reduce the exposure to adequate levels. To get the necessary number of amp-m², of say with 1000 square meters for a 100 foot diameter craft, we might need 10¹¹ amps. If the superconductor had say 100 sq cm, then we are looking for a superconductivity of 10⁹ amps/cm². In addition, the stabilization of the craft would be critical because upsetting torques would have to be neutralized and probably use physical rotation as a backup. If the inside is not spinning, then there needs to be bearings between the spinning superconductor and the non-spinning payload portion. In principle, these craft could operate anywhere on the planet since the magnetic field is significant everywhere. It would be easy to use the earth's magnetic field to launch a dipole-powered craft to orbit easily if it can be made to work at sea level,

since the earth's magnetic field only goes down 10% at 100 miles altitude. See Appendix A for more detailed design parameters.

Gravity Control Technologies

It is evident to most who study the UFO reports that the observed accelerations and the implied velocities from other star systems would clearly imply an ability to interact with both gravity and the space vacuum and perhaps time as well. There is no accepted theory available now, although several researchers claim to be working on it. The UFO data suggest that large magnetic fields have often been observed with some craft, and that others hover with a hum, and then accelerate at high g's. While it may be possible to create a gravity control device without superconductors, it is our consensus that an investment in advancing superconductor technology would have the largest payoff. Such a plan is recommended in connection with the propulsion scope of work, involving materials, nanotechnology and superconductivity research with defined interim goals. We would recommend that this more "conventional" research effort be augmented by studying a variety of "leaked" documents of earlier possible classified real research for the purpose of idea stimulation, such as notes allegedly involving Einstein.

Ducted fans

If you visualize the science fiction Jetson or the Flintstone daily lives, they involve cars that fly easily. Forgetting about balloons and airplanes as discussed above because we understand them pretty well, the first mild opportunity seen is the VTOL using ducted fans for lower noise, higher efficiency. Counter-rotating ducted fans might work very well on a variety of vehicle designs, with the objective of providing a lightweight efficient transportation system supported by sophisticated collision avoidance systems. It is our understanding that there is lots of room for optimization of fan technology, since most of the research to date has been driven towards improving single helicopter blade design or single blade horizontal wind turbine designs. Ducted fan optimization has not been a priority. One of the theories suggests that a large improvement in efficiency is possible, although one could not define this as a breakthrough technology, it might have a handsome ROI. As a footnote, the same technology that will help on vehicle design is applicable to the improving sophistication of wind turbines fans for the capture of wind energy. However, we do not recommend an investment in this area at this time.

Plans of Action

Toroidal magnet craft

To establish the feasibility of this concept it would be reasonable to prove the concept by designing a small scale model using superconductors. Without an attitude control system, it would not be able to be untethered, but the principle could easily be established by comparing the expected forces with the actual ones in a simple test apparatus. A small team, once formed could probably demonstrate a preliminary conclusion in six months. The team should consist of one physicist who is familiar with magnetism, one superconductor engineer/scientist who is familiar with capabilities and sources, and one versatile laboratory technician who will actually do the physical work. No unusual power sources would be expected, since this should be a low power device. We would suggest the following milestones:

- Week 0: Team under contract with facilities and equipment available
- Week 4: Test model sized and designed
- Week 8: Parts ordered and wooden fixture complete
- Week 12: Parts arrived, assembly begun
- Week 16: Testing begins
- Week 17: Results surprise everyone, require redesign
- Week 25: Proof of principle established
- Week 26: Scale up to full size is underway, new budget planned

Gravity Control with Superconductor Research

One of the milestones in this research would be to demonstrate 10^7 amps/cm².

Appendix A – Hovering in the Earth's Magnetic Field

A toroidal or doughnut shape containing a current will produce a magnetic moment M , determined by the strength of the circulating current i shown in slide 1. If it rests in an external magnetic field B , then the force and torque on the ring's current structure are given by the equations shown. The force depends on the gradient of B , or the direction in which it changes most rapidly, as well as the orientation of the toroid. It should be possible to always provide a vertical force for lift against the earth's gravitational pull.

The variation of magnetic field strength B is shown in slide 2, both for on the axis of a dipole and in the plane normal to the axis. Both in the plane and along the axis far away from the dipole, the strength drops off as $1/r^2$. Therefore, since the earth's radius is about 4000 miles, at 8,000 miles the magnetic field is one-fourth as strong. However, there is no significant difference between sea level and orbital altitude of only a few hundred miles.

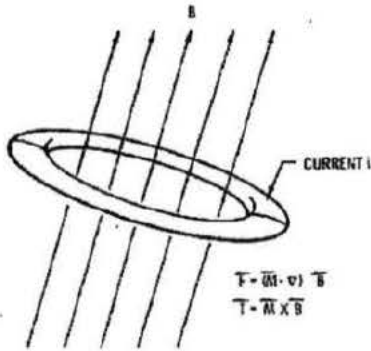
Slide 3 shows that the variation of both the field strength and angle vary with latitude, with the strength being about twice as strong at the pole as at the equator. As expected, the magnetic field points straight up at the poles and is essentially horizontal at the equator.

If the orientation of the dipole is assumed to be positioned to minimize the unwanted torque that would cause it to change its orientation, the force on the dipole varies from a maximum near the north or south pole to a nominal value at the equator, roughly only a factor of two between the pole and the equator, as shown in slide 4. Fortunately, the angle of the force with respect to the vertical varies only plus or minus about 20 degrees, so you always have more than 90% of the force in the lift direction. The value of the nominal force F^0 depends on the current going around the toroid and the area of the circle formed by the (circular) axis of the toroid. So, for one amp-m², the force is very small, since there are about 10 newtons associated with the mass of one kg. One newton is about 3 ounces of force.

The magnetic field strength produced by the toroidal dipole is proportional to both the current flowing and to the area surrounded by the toroid. From a practical point of view, designs that support a weight of less than 1000 pounds are probably not very interesting, so we will be operating above about 10^{14} amp-m², seen on slide 5. For a 20 meter diameter toroid, one would expect about 10^{10} gauss, or 10^6 tesla. This large a field would have major impact on living organisms, so internal shielding would be in order.

For the toroidal vehicle considered, the relationships between force, radius, size and vehicle density are known as shown. Lines of constant vehicle density correspond to lines of constant amp-m². The useful range for consideration is somewhere between that of water and air. Missile, spacecraft and airplane densities range between x and y . This says that we probably need 10^{15} amp-m², and for a 10 meter radius craft we can get about a 500,000 pound force available, for the "design noted" point on slide 6. This will result in interesting designs if superconductors of 10^6 amps/cm² are available such as with yttrium barium copper oxide.

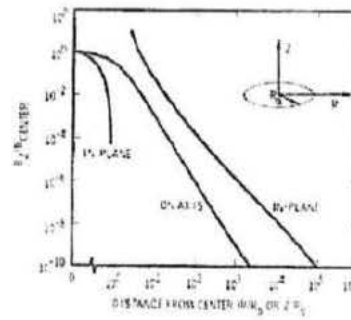
Magnetic dipole



10/28/2008

1

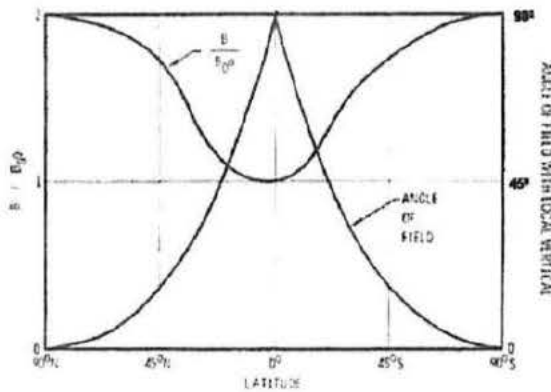
Magnetic field for a dipole



10/29

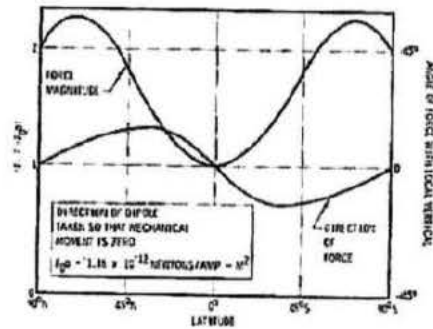
2

Variation with latitude



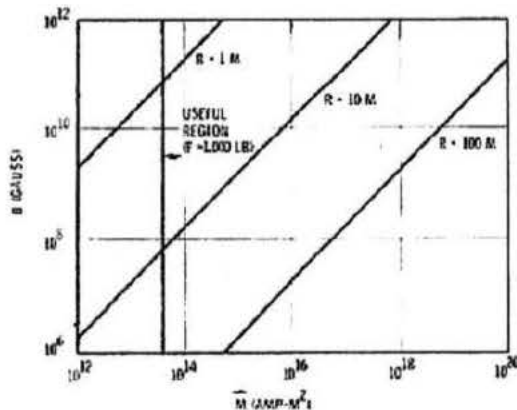
3

Earth force on magnetic dipole



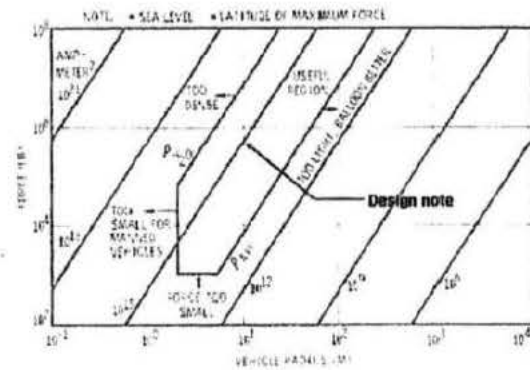
4

Moment, field, size relations



5

Magnetic vehicle parameters



6



POWER GENERATION

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ABSTRACT

This proposal suggests the purchase and subsequent use of an already-designed research facility to develop the principles of cold fusion to permit a breakthrough in the planning of full-scale development for low temperature nuclear power.

Introduction and background

Power generation for aerospace vehicles has been studied extensively especially since the beginning of the space age due to the long-term requirements for satellite power. The discovery of how to extract energy from the zero point vacuum is still awaiting experimental demonstration and a useful theory. The use of conventional nuclear power in aerospace vehicles continues to be dominated by the negative effects of radiation safety and attendant weight penalties. If, however, nuclear sources could be found that would generate only heat and no hazardous radiation, this would be a potential breakthrough. The results of cold fusion experiments suggest that this is indeed the case.

Cold fusion has a marvelous data base of success, but usually at low temperatures, whereas the first anomalous reports involved reactions so hot that there was damage to the laboratory. We have not seen an aggressive attempt to replicate at high temperatures and pressures conditions that result in confirmed cold fusion nuclear reactions that emit no neutrons or gammas – nothing but heat.

When 1843(a)(2) in 1989 reported anomalous heat generated during an experiment¹ they failed to initially report that in 1985 they did an experiment that provided excess heat starting from an aqueous solution of deuterium and palladium. However, it boiled dry and got so hot that it melted some of the laboratory bench. As in many hard-to-accept anomalous results, there was no accepted theory that would reasonably permit the widespread acceptance of an explanation for the obvious nuclear reactions that were occurring ($d+d \rightarrow {}^4\text{He} + 23.8\text{Mev (heat)}$). The immediate reaction of scientists was to try to replicate these experiments, and the initial attempts were not generally successful. This gave opportunity to the powerful "hot fusion" community to gradually attack the results and the data, partly to ensure a strong continuing budget for hot fusion. In the meantime, laboratories all over the world, with many varied experiments, were able to show over the years very powerful evidence for the reality of the excess heat, but still lacking a theory. A beautiful summary was prepared for the Department of Energy by five respected scientists.² This 30-page paper in effect says: (a) there are numerous reports of energy production at the levels of megajoules/cm³; (b) near- equal

1843(a)(2)

atomic mixtures of deuterium and palladium work best; (c) it is more productive at higher temperatures; (d) there are unknown triggering effects to get the reactions started; (e) the ddHe reaction noted above is the main source of energy; (f) sometimes neutron emission is observed; (g) calorimetric studies have left no doubt that these excess energy results are valid. Nevertheless, the study of cold fusion research is still not an accepted national priority.

In spite of overwhelming evidence for the reality of the phenomena as reflected in the maverick publication *Infinite Energy*, and annual meetings of the *International Conference on Cold Fusion (ICCF)*, theories to explain the data have slowly emerged. One idea that seems to survive is that in the experiments involving solid samples that photon exchange (high frequency acoustic vibration) are responsible for stimulating the nuclear reactions.³

Another theoretic approach was taken by former McDonnell Douglas employees, [1843(a)(2)] and his innovative colleague [1843(a)(2)] who interacted with [1843(a)(2)] of SRI and [1843(a)(2)] and developed some basic principles that would be aimed at replicating the conditions of the successful [1843(a)(2)] experiment that apparently had high temperatures and internal pressures involved. Taking the position that in order for cold fusion to be a successful business venture, excess energies of Kw/cc will be required, and these will never occur unless we go to high temperatures and pressures. Therefore, by studying the "boil-dry" case of the F&P experiment, they were able to identify the operating regions of interest, shown in Figure 1. At 700 to 900 °C one could expect to attain 5 to 10 Kw/cc.⁴

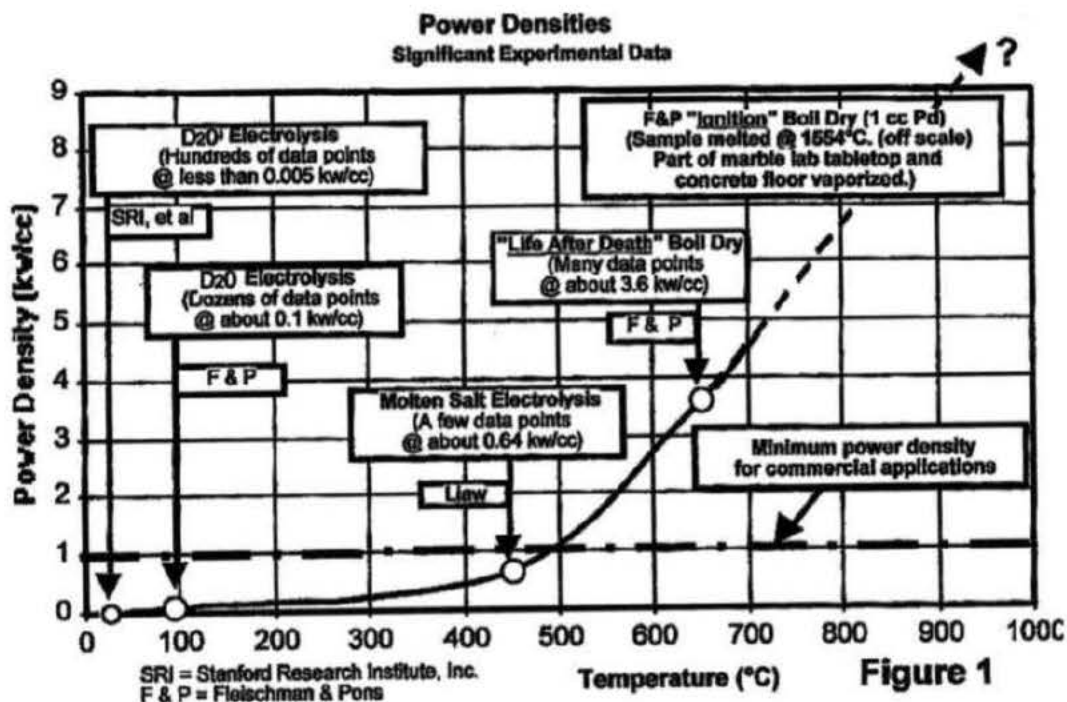


Figure 1. Based on nothing but experimental data, this shows that to get several Kw/cc we need to be operating at temperatures above about 600°C.

[1843(a)(2)]

Referring to Figure 1, when 1843(a)(2) allowed his electrolytic cells to increase in temperature from 20°C to 95°C, the power density increases from about 1 W/cc(Pd) to about 100 W/cc(Pd). This is a remarkable increase in power density for just a 75°C increase in temperature.

1843(a)(2) While 1843(a)(2) molten salt experiments were very difficult to replicate, he measured about 640 W/cc(Pd) at 450°C.

1843(a)(2) The experiment that is critical, however, is the 1843(a)(2) "1 Cubic Centimeter - Ignition" experiment that went awry in 1985. 1843(a)(2) were using a 1 centimeter cube of palladium as the cathode in an electrolytic cell that was operating at a controlled 20°C and producing about 1 watt of excess heat. Unaware of an impending electrolyte replenishing system failure, they left the cell operating unattended over a weekend.

1843(a)(2) When they returned, the lab was a mess. Apparently, the cell had run dry so that the heat transfer coefficient from the Pd cube to its surroundings decreased from about 0.9 in the liquid to something closer to 0.1 in air. The few watts of heat being generated was more than could be transferred to the air and positive temperature feedback occurred. The temperature rose as did the fusion reaction rate and the cube of Pd melted its way free of the test apparatus. The Pd temperature was driven to its melting point of 1554°C and part of the palladium vaporized. In addition, the heat from the Pd cube vaporized a hole in the marble-like lab table and created a depression in the floor by vaporizing the concrete. It was apparent that the high intensity reaction had endured for an extended period of time. There is little doubt that high-density heat had been produced at high temperature.

1843(a)(2) 1843(a)(2) thought they had achieved "ignition" and they warned their colleagues never to let that happen to them. *This was the first split in the road to practical applications that was missed!*

1843(a)(2) 1843(a)(2) later conducted controlled 'boil dry' experiments using palladium rod of varying diameters and experienced the same acceleration of the fusion reaction rate into the high-density range when the electrolysis was stopped. *This was another split in the road that was missed!*

Figure 1 suggests that: (1) operating temperatures in excess of 500°C are required to enter into the 'high density heat' range and (2) the continuous flow of electric power is not required to accelerate the reaction rate.

1843(a)(2)

Can the conditions that existed when 1843(a)(2) produced 'high density heat' be replicated?

The main thrust should be to design and construct a new fusion reactor based on a 'gas loading' principle rather than 'electrolytic loading'. With gas loading, the system temperature limitation is no longer the boiling temperature of the heavy water electrolyte but rather the strength of the pressure vessel that contains the fusion reaction. By choosing a space-age alloy with high strength at high temperatures, it is possible to create the conditions that existed when high-density heat was produced in the past.

Also, with the ability to maintain high D₂ gas pressures at high temperature, it makes it possible to maintain system energy levels well above those threshold levels apparent from electrolytic experiments that produced fusion heat.

The key variables to control are the concentration of deuterium (D/Pd ratio), the deuterium gas pressure and the temperature. Fortunately, from the interpolation and extrapolation of data from other sources, an equilibrium diagram can be produced and is shown as Figure 2.

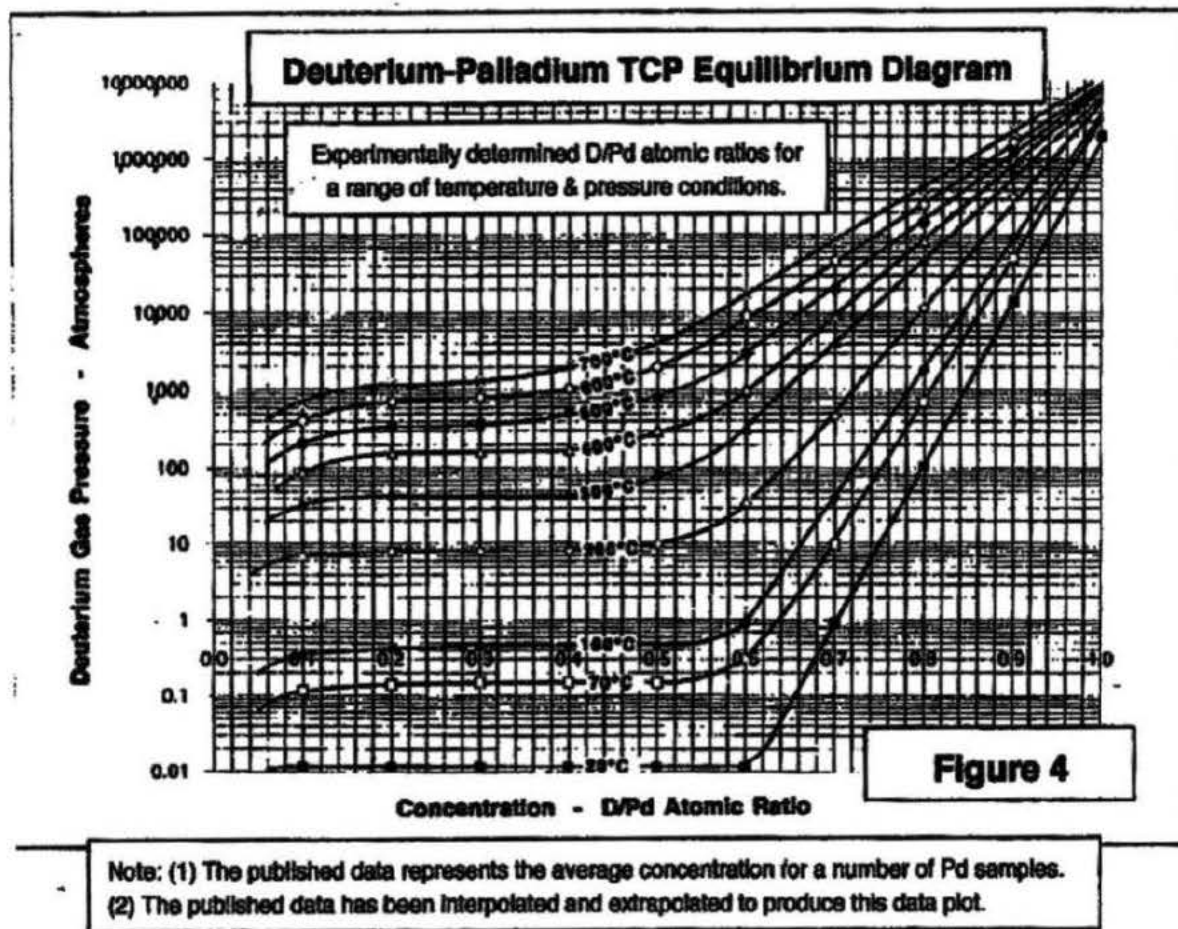


Figure 2. If the system is in equilibrium, this chart permits you to determine the pressure required to maintain a reaction at constant temperature and deuterium concentration.

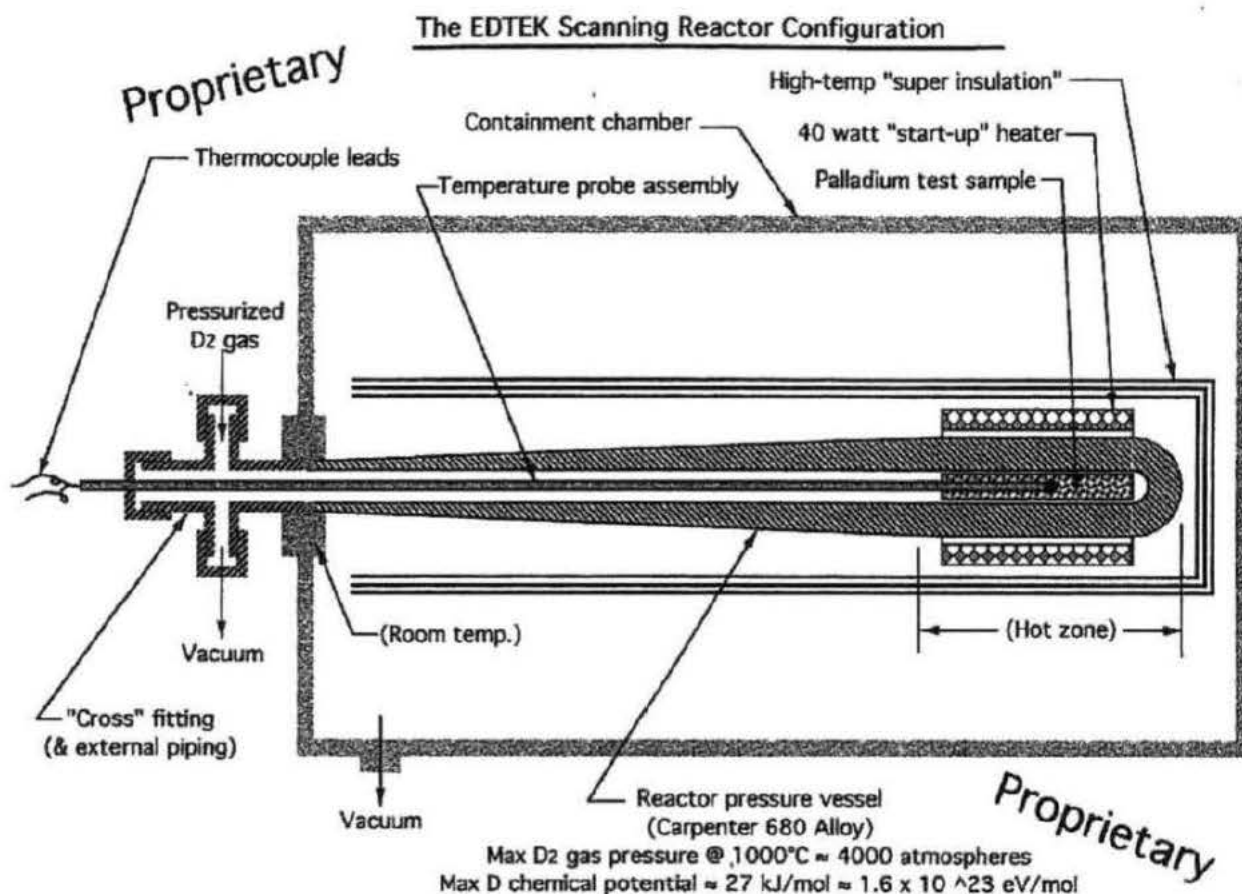
Ranges of interest appear to be in the thousands of atmospheres to perform meaningful steady state studies. For example, if we are forcing deuterium gas into the palladium lattice at a concentration of 0.7 and 500 °C, we would need a pressure of 20,000 atmospheres. The goal is to produce an uncontrolled 'high density heat' and to repeat it at will. Thereafter, it is an engineering development job to learn how to control the fusion reaction and give it utility.

Engineering Development

These kinds of requirements led to the design of a reactor capable of studying the reactions at high temperature and pressure, schematically shown in Figure 3. This reactor has actually been built and has never

had enough funding to perform any experiments yet. It will permit the evaluation of reaction rates as a function of temperature, concentration and pressure for gaseous deuterium forced into solid palladium. A great deal of thought and detailed design work has gone into making this a quality unit. The experimental program would naturally pay high attention to the safety issues in the use of this scanning reactor. In collaboration with [REDACTED] the reactor was designed and built by [REDACTED] EDTEK Corp, who is reportedly willing to sell it for cost, which was about \$10K for materials only. Although this sketch is stamped "Proprietary," we have been given verbal permission to use this sketch in the present context.

1843(a)(2)



[Note: All cross-sections shown are cylindrical in shape.]

1843(a)(2)

Figure 3. This design configuration has been built and is now in place at the EDTEK Corporation, under the control of [REDACTED] who built it and paid for it.

Once the principle of producing high density heat has been proven, one would move on to characterizing the reaction enabling parameters and develop control methods for any anticipated unstable reaction. Intimately tied to the control development is the extraction of useful heat. It is called a scanning reactor, and was licensed to a company called EDTEK, partly owned by [REDACTED], an interested collaborator with [REDACTED] and [REDACTED].

The EDTEK Scanning Reactor is ideally suited to this kind of activity because its unique design allows for quick turnaround for the next test. The reactor pressure vessel is inexpensive and can be replaced in short order in the event of a 'melt-down'. The unique design of the scanning reactor makes it practical to modify it for installation of electric feed-throughs and for the introduction of electromagnetic stimuli to support reactor control development. The reactor is called a "scanning reactor" because of the ease of changing samples. Hydrogen is very difficult to contain and it is best to open only one high pressure joint when preparing a new test. (Note that the samples are loaded through the "cross" fitting which requires re-sealing only the one pressure joint.)

Also, four design features are worth noting: (1) the tapered pressure vessel reduces heat loss by conduction while maintaining uniform pressure vessel strength over its length (large wall thickness in the 'hot' zone); (2) Convection to the outer chamber wall is eliminated by operating in a vacuum; (3) radiation losses are greatly reduced by surrounding the hot pressure vessel with high temperature multi-layer "super insulation"; and (4) although not shown, there is a snug-fitting tube, made of 'alumina', inserted over the temp probe to fill the space inside the length of the pressure vessel to prevent significant convection and conduction losses in the high pressure deuterium gas. Alumina is very good insulator but its presence does not prevent rapid migration of deuterium molecules along the length to equalize pressure. The Carpenter 680 Alloy, used in the pressure vessel body, is one of several high temperature alloys developed for the manufacture of gas turbine blades in jet engines.

Once the principle of producing high density heat by gas loading is proven, we are on the pathway to a broad range of useful applications even without knowing the precise micro-physics involved. It is axiomatic that we are able to ensure that the products of the reaction are just helium and heat. Once the principles are established, there is no reason to not visualize scaling cold fusion reactors up and down in size.

It is virtually certain that successful production of high density heat in the existing scanning reactor will bring new insight to the micro-physics of solid state fusion and hasten its entry into the textbooks.

If we succeed in proving both the principle and the practical production of safe energy from cold fusion, we may also have done a great service to our country by moving toward energy independence from foreign oil, avoiding the eventual depletion of hydrocarbon fuels and be the leader in commercially producing and selling inexpensive energy.

For aerospace applications, it might turn out that to be possible to scale down the normal cold fusion power plant into a self-contained package providing the required energy for a long time. Feasibility needs to be proven first.

Plan of Action, Milestones and Team

Once the principles of low temperature nuclear reactions using palladium and deuterium are proven, the possibilities for an inexhaustible source of power are excellent. Deuterium occurs naturally in sea water and can be easily extracted. It will be converted to helium that will escape the planet. Palladium is the first material discovered that seems to promote low temperature fusion, but there may be others. Palladium is not destroyed in the process - it is merely the catalyst or host that permits the reaction to proceed. Palladium has use as an auto catalyst for reducing emissions and in jewelry, and typically sells for \$750 per ounce, so it's not cheap. Its density is about 12 times that of water (it is heavy) and can absorb 700 times its volume of hydrogen or deuterium. However, the basic cost information suggests that one could achieve thousands of watts with just one cubic centimeter costing only a few dollars. The cost of 50 liters of deuterium is about \$250 but a small amount produces many Kw-hours of energy. The energy release from two atoms of deuterium combining to form helium is roughly a million times the energy of two hydrogen atoms in a fossil fuel burning with oxygen.

The first step would be to arrange to examine the scanning reactor to ensure its availability as described, and arrange for a purchase and transfer to a suitable testing location. Then, a test plan needs to be prepared by those familiar with other experimental work in cold fusion. I think that designer 1843(a)(2) and owner 1843(a)(2)

[redacted] would be happy to assist in some planning part time. [redacted] 1843(a)(2) of SRI at Menlo Park, California is reported to be enthusiastic in using such a test facility to more accurately assess the conditions that cause the deuterium atoms to fuse. The testing should be done by personnel who have knowledge of the field and the skills to deal with fire and explosion safety issues. A schedule could probably be provided by them if requested. The things that would need to be done are to ensure a safe location, order the measurement instruments if not available, order the palladium and deuterium, and prepare a testing schedule. This probably could be done in six months if a few of the right people were put on the job. Typical milestones would be:

- Week 0: Make initial contact with owner
- Week 3: Complete contract negotiation
- Week 8: Complete staffing
- Week 8: Move the equipment
- Week 9: Order the palladium and deuterium
- Week 10: Complete test plan
- Week 16: Attain first positive feedback
- Week 26: Obtain repeatable data records

Steps that follow would address commercial design applications and implementation.

In conclusion, this is a great chance to pick up a well-planned unit designed to prove the reality of cold fusion, explain the scientific principles involved and pave the way for planning commercial energy sources independent of oil.



Control

MUFON Advanced Technology Establishment Fort Collins, Colorado

ABSTRACT

Traditional aircraft controls have been perfected over the long history of powered flight, evolving from mechanical hydraulic controls to fly-by-wire computer controls. Today's most sophisticated commercial and military aircraft are almost exclusively fly-by-wire systems with some allowing for manual override.

Aerospace vehicles of the next century will use breakthrough propulsion and lift technologies that will require equally innovative vehicle control systems. For example, if a lift vehicle is designed to nullify or counteract gravity, traditional aircraft controls that render proper pitch, yaw and roll could be replaced by non-airfoil manipulation technologies that maneuver the vehicle using the lift/propulsion field itself.

Technical Approaches and Concepts

The design of a control system for an advanced aerospace vehicle is directly dependent on the propulsion and lift method used. Electro-magnetic induced superconductor lift/propulsion could be controlled, for example, by modulating the current in the superconductor through a combination of:

- Phase shift modulation (PSM)
- Pulse width modulation (PWM)
- Frequency modulation (FM)

Consider the control system that could be used to control a Superconducting Toroid craft:

The proposed Toroid craft is comprised of an inner ring and an outer ring. The inner ring contains the occupant compartment, power generation system compartment, controls compartment and navigational system.

The inner ring would consist of multiple sections of superconducting material and a supporting section. This supporting section would interlock with the corresponding outer ring's channel. The inner ring would not have to rotate.

The outer ring has to contain a channel for an interlocking section of the corresponding inner ring. There are many possible formats for each ring. The principal idea of this design is to maintain the stability of the outer ring and the integrity between the inner and outer rings. The primary purpose of sections 1 and 2 would be to rotate the ring, while section 3 of the ring would control the speed and direction of motion of the craft.

A. For initial startup, we need to impart the energy necessary to bring the outer ring up to superconductivity. This would most likely be by means of direct contact to the outer ring from the vehicle's power source.

B. After initial startup, we could use microwave beaming techniques to add power to the outer ring as needed to maintain superconductivity.

C. The outer ring would be rotated by controlling the inner ring's sections using a push-pull control effect as accomplished by maglev train systems. Instead of moving in a straight line, however, this system would operate in a closed loop.

In order for the craft to have control in a magnetic field, we'd have to be able to alter the PSM/PWM/FM in sections which are opposed by 180 degrees – one side pushing against the magnetic field and one side pulling towards the magnetic field. This would be computer controlled allowing for changes on three different axes so as to affect the roll, yaw and pitch.

The strength of the magnetic field produced by the superconductors would allow you to accelerate and decelerate the craft in the desired direction within the earth's magnetic field. The limits would have to be controlled to protect the occupants of the craft from excessive G forces.

Vehicle Control Summary

The functional controls for the superconducting vehicle would consist of five primary systems:

System 1 would control rotation of the outer ring.

System 2 would control the saturation of the superconductivity in the outer ring and control speed and direction of the craft.

System 3 would counteract the magnetic effects between multiple rings.

System 4 would prohibit the vehicle from exceeding G-forces which could be harmful to human occupants.

System 5 would be a fail-safe system to protect the craft, including but not limited to, an anti-collision automatic control system.

The entire control system for superconductivity is dependent upon the pulse width, phase shift and frequency modulations.

Plan of Action

To establish the feasibility of this concept it would be reasonable to prove the concept by designing a small scale model. A small team, once formed could probably demonstrate a preliminary conclusion in six months. The team should consist of one Pulse Power Engineer, one Mechanical Engineer, one Physicist and one Electrical Engineer with experience with Maglev technology. We would suggest the following milestones:

Month 0: Team under contract with facilities and equipment available.

Month 3: Computer modeling on superconductor —maglev vehicle control system finalized

Month 4: Parts for small scale mockup purchased

Month 6: Small scale mockup laboratory tested

References:

1843(a)(2)



HUMAN INTERFACE

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ABSTRACT

The human mind is a remarkable instrument that may be used in the future to control various functions, including flight. The scientific study of implants found in human beings may lead to technologies which could lead to this giant leap. Unlimited possibilities for payoff exist in the form of mind control for everything from vehicles to military defense systems to medical advancements.

Introduction

The human mind "is the most advanced device ever developed for information correlation, pattern recognition and anomaly detection. All of our senses are superbly designed to collect, correlate, and analyze continuous streams of information; to discard irrelevant information at high speeds; and to make intuitive connections."¹

Current flight technologies are completed by direct physical intervention of the operator. This is accomplished by the use of the hand, foot, eye or head movement. Will the remarkable human mind be tapped as a controlling force as well?

Future technologies may include:

A. Direct mental telepathic interaction with a computer system to control aspects of flight.

Telepathy has two aspects. First, there is the formulation of a particular thought; secondly, the individual who has the particular thought must have the ability, innate or learned, to send that thought to a receiver. Psychokinesis is a term used for a type of telepathy that goes one step further; it refers to a direct physical influence, such as distortion or movement, utilizing only the power of the mind. To date, studies in psychokinesis have yielded little in the way of statistically significant, repeatable results.

B. Utilizing the electrical activity in the brain via externally mounted sensors.

Referred to as synthetic telepathy, this technology utilizes electrodes in contact with the human scalp. Emissions from the brain "are passed through an amplifier, which sends the results to a computer for processing."²

Research in this area is ongoing both for military purposes and for gaming. Medical research, which is focused on the ability of a patient to move various types of controls using only the emissions from their brain, may offer the disabled new avenues of communication.

This technology has also been studied in relation to flight. Subjects at Wright-Patterson's Aeronautical Systems Center learned to control their brain emissions, enabling them to send instructions to a flight simulator.³

One of the problems encountered with this technology has been the difficulty in obtaining precise readings. A scientist in Berlin is attempting to improve those readings through the use of a cap that is embedded with electrodes. Conductivity is enhanced by the application of a gel between the cap and the skull.⁴

C. Biologic interface to the vehicle.

Some abductees have stated that while onboard a UFO, they observed a place for the craft operator's hands to rest in. This may have represented either the use of the hand operating as a lock function or as a tactile biologic interface to the vehicle.

D. Virtual reality.

Virtual reality permits an individual to interact with a computer-simulated environment. A virtual helmet, goggles with video display, full bodysuit including gloves, boom arm and omnidirectional treadmill provide tactile feedback. Outfitted in this manner, the operator would feel total immersion in whatever craft or vehicle he was controlling, permitting him to control and feel all actions and related effects. All body changes or actions would be directly converted to corresponding vehicle control or whatever the intended action was. Future studies may allow an operator to direct flight in a virtual environment which could be located anywhere.

E. Bi-directional conversion of thought patterns to mental electrical stimuli through the use of biologically powered implants.

Numerous implants have been discovered in humans and are being removed at an increasing rate. How the implants were placed or what activities and physiological states they monitor is unknown.

The University of Copenhagen has been conducting studies, including one in which they focused a magnetic beam at the back of the subject's head. The beam affected the visual cortex and caused temporary blindness on a conscious level. The studies also indicated, however, that the individuals were able to react to certain directions on an unconscious level - as if they could still see.⁵ What other human reactions could be temporarily suspended or controlled by focusing a magnetic beam to other parts of the brain or body? Might there be an association with implants and transcranial stimulation?

An implant may serve as a targeting lead, to the individual and/or to a specific site on the body for magnetic beam placement. Could a study in this area give us clues as to why so many experiencers are unable to recall events on a conscious level, recalling them only under hypnotic regression or while in a subconscious state?

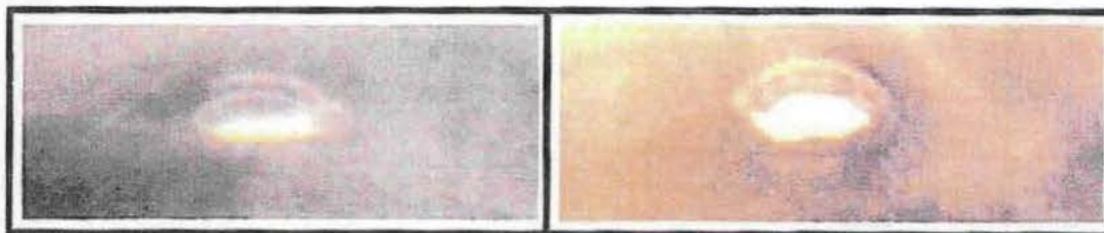
Prospect for Research Payoff

It is hypothesized that the implants noted above are bi-directional communication devices. If it were possible to reverse engineer the implants and understand how they function, we very well may have a direct mind-to-vehicle interface capable of controlling the flight characteristics and defense systems of a craft. Associated commercial ventures might include mind interface to control vehicles, equipment, and weapons systems. The possibilities are limitless.

Plan of Action and Milestones: Implant Removal

To the best of our knowledge, current efforts to remove implants do not include proper, complete scientific investigation.

MUFON is in possession of copies of x-rays which may provide evidence of implants in unsuspecting U.S. citizens.



The implants, which are about the size of the tip of a pen, were found in a 16-year old female and a 76-year old male from different parts of the country - one from the northeast and one from the southwestern part of the U.S.

UFO literature reports that some implants exhibit magnetic properties and emit a frequency without any apparent external excitation. Upon removal, they become non-magnetic, cease transmitting and start to degrade. It is hypothesized that they derive the power to run from biochemical means. While it is known that RFID tags are already in military and public use, the implants of our proposed study are distinguished by their tiny size and by the fact that they do not require external excitation.

A complete investigation protocol has been developed and proposed to MUFON (Implant Investigation Proposal). While other researchers have extracted and analyzed implants, MUFON's proposal is to study them *in situ* as well as to extract and analyze them through unique methods, maintaining their functional operation for external study or manipulation.

The investigation would seek to capture the waveform, analyze its data stream, and try to correlate possible brain activity with the waveform characteristics. This would be accomplished by using a CT scan, MRI scan, electroencephalograph, and a RF Spectrum Analyzer. One of the goals of the RF engineer would be to continue operation of the implant after extraction. A proposal identifying equipment for a Mobile Command Center for multiple purposes, including implant removals has been submitted to MUFON (Analysis of Equipment Needed to Conduct Field Investigations).

The team would be composed of:

1. Physician or dental surgeon (licensed in the location of extraction) to perform minor surgery;
2. Radio-frequency and digital electrical engineer with experience in the medical field;
3. A biochemist with a metallurgical background;
4. A biophysicist;
5. Project administrator; and,
6. Two mental health professionals. The role of the first mental health professional would be to discuss the pros and cons of the procedure with the experiencer prior to signing a consent form. The role of the second mental health professional would be to counsel the experiencer and to facilitate follow-up after the procedure.

Volunteer patients with implants that have been detected in relatively current image scans (X-ray, CT scan, MRI scan or panoramic head scan) would be needed.

Milestones:

Three Months - Team recruitment complete.

One to Two Months - Equipment acquired. In this second phase, items may be purchased or rented depending upon the availability of funds. If renting, we would most likely be able to secure items within a short time frame. In the event that a mobile unit may be utilized as a removal site, there are a number of unknown variables which would affect the time frame.

Four to Six Months - Volunteers recruited.

One Month - Cases selected. A committee would review and select cases for the project.

Twelve to Eighteen Months - Data collected. This phase would include the actual removal, examination, disassembly and data collection relative to the implants.

One Month - Data reviewed and summarized. In this phase, data collected would be reviewed by our sponsor to identify potential engineering projects. At this point, a decision would also be made as to whether the project would continue and if so, its scope.

Times for the various phases may overlap in some instances. The goal for the initial project would be completion within 18 to 24 months. Costs incurred prior to actual equipment acquisition and testing would be minimal.

References

1843(a)(2)



PROPULSION

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ABSTRACT

Chemical based propulsion of space vehicles allows for the exploration of our solar system but is not feasible for interstellar travel. A solution to this must come in either the ability to travel near the speed of light or by changing the dynamics of travel through some type of warping of space.

Introduction

Theories for interstellar travel have been discussed as early as the 1970s by the British Interplanetary Society in "Project Daedalus", which hypothesized the use of micro fusion explosions to develop thrust sufficient to reach near-light speeds. NASA supported the Breakthrough Propulsion Physics Project from 1996 through 2002. Their object was to seek the ultimate breakthroughs in space transportation: propulsion that requires no propellant mass, that attains the maximum transit speeds physically possible, and breakthrough methods of energy production to power such devices. Topics of interest included experiments and theories regarding the coupling of gravity and electromagnetism, vacuum fluctuation energy, warp drives, wormholes, and quantum effects. NASA continued this thought process with the NASA Institute for Advanced Concepts from 1998 to 2007. The project ended due to funding cuts.

There are a myriad of possibilities regarding interstellar travel, but they are all still very hypothetical. It would be beneficial if there was something to point a development project towards a research area with the most hope for success. Although controversial, it is worth considering whether the properties of unidentified aerial phenomena that have been witnessed over the last 50 years could be explained by any of the current theories for interstellar propulsion. Observations of this phenomenon by pilots, military personnel, and witnesses with a scientific background, provide the following characteristics:

1. Ability for rapid acceleration, deceleration, and hovering capabilities.
2. Ability for sudden changes in direction.
3. Vehicle shapes vary and are often not aerodynamic.
4. Objects over 400 meters in size capable of hovering and/or moving slowly.
5. No visible rocket nozzles or propulsion system.
6. There is a lack of air displacement causing turbulence with movement of the object.
7. There is no indication of the sound barrier being broken even though the witnesses claim speeds above Mach-1.
8. Often there is no noise associated with the object while it is moving. Sometimes a slight hum is heard if the object is hovering.
9. The presence of electromagnetic fields is suggested due to plasma glows, varied colors, and interference with electronics.

A research team should compare the current theories for interstellar travel against these properties and then determine which of the theories best approximates the seven conditions noted. This was initially done by 1843(a)(2) a former research scientist at NASA and the Langley Research Center. The theory and mathematics is outlined in his book published in 1995, 1843(a)(2). 1843(a)(2) In his treatise he posits that a controlled repulsive field such as anti-gravity would best explain the flight characteristics that have been attributed to unidentified aerial phenomena. This theory still best supports the characteristics previously mentioned.

This paragraph summarizes how an anti-gravitational field could explain some of these characteristics. Assume that a spacecraft is developed which is capable of placing itself within a field that can repulse the earth's gravitational field in a controlled manner so that the craft can hover as well as move in different directions. Such a craft would be able to accelerate rapidly and change directions without large g-forces being experienced by the occupants of the craft because the acceleration that occurs is through the movement of a field not the movement of the object, per se. Since the craft is contained within a field, the need for an aerodynamic shape is not critical unless it needs the ability to move through an atmosphere using standard propulsion methods. Since aerodynamic requirements no longer affect the craft, the size of the craft could be very large. No external propulsion mechanisms would be needed as the craft is controlling the gravitational field around it in order to move. But would such a craft enclosed in a field displace air as it moves, and cause turbulence in the surrounding atmosphere? Or since gravity is a warping of space-time, would the craft not "truly" be in the atmosphere? This is a difficult question and should be addressed by the research team that is assembled as should the other points discussed in this paragraph.

Anti-Gravity or Negative Gravitational Fields

A controlled anti-gravitational field not only explains observations of unknown aerial phenomena but will also be beneficial to study for two reasons. The first support of this avenue of research is that there is literature indicating the possible development of this propulsion method using current technology. The second justification is that since this area of technology development requires the use of superconductors, research in this field may also have side benefits to other technologies and other propulsion techniques that utilize superconductors.

Literature that supports the development of anti-gravity techniques was first mentioned in the 1960s. The Gertsenshtein Effect was postulated as a wave resonance solution to Einstein's general relativity field equation. It predicts an emitted gravitational wave due to an electromagnetic wave propagating through a static magnetic field. This effect was tested in the laboratory and described in a paper in 2001 by 1843(a)(2) and 1843(a)(2)

1843(a)(2) (1)(2) Utilizing a ceramic superconductor to generate a high field, they describe an EM discharge that exerts a short repulsive force on small movable objects along the propagation axis. Within their measurement error, the impulse's effect is proportional to the mass of the objects and independent of their composition. It therefore resembles a gravitational impulse. The Gertsenshtein Effect has also been covered in recent theoretical papers by 1843(a)(2) argues that the development of gravitational propulsion should begin now 1843(a)(2) and 1843(a)(2) describe an experiment for the generation and detection of High-Frequency Gravitational Waves (HFGWs) in the laboratory utilizing a pair of tabletop X-ray lasers.

There is also a certain advantage and flexibility to exploring the use of anti-gravity for interstellar propulsion. Even if research in this area does not prove fruitful, the research related to the improvement of current superconductor technology will be a valuable business investment, which can improve the ability to create high-density magnetic fields that are used in other propulsion technologies and scientific fields. These include propulsion through electromagnetic plasma thrusters, magnetoplasma dynamic thrusters⁽⁸⁾, fusion RAM jets that use a magnetic field to collect protons in space⁽⁹⁾, antimatter containment⁽¹⁰⁾, and electromagnetic rail guns for sub orbital launches.⁽¹¹⁾ Although these other propulsion technologies are less likely to provide a method of interstellar travel, but instead a more efficient method of travel within the solar system, what is learned here may also benefit those areas of research. There are also a myriad of other uses for this type of technology in the areas of high current transmission for power lines, improved MAG-LEV trains, and controlled EMP. This is an excellent area of research because it affects so many other technology fields and has the capability of generating potential profits.

Plan of Action

Analytical Team

The areas of expertise required for the development of anti-gravity include individuals who have research experience in:

- (1.) (Material Scientist) The development of state of the art superconductors, especially $\text{YBa}_2\text{Cu}_3\text{O}_{7-y}$ or comparable high temperature superconductors. Experience in other types of superconductor materials besides yttrium-barium should be considered because it is not yet known what type of material would make the best superconductor.
- (2.) (Physicist) The physics associated with high-density electromagnetic fields.
- (3.) (Physicist) The understanding of the various theories related to gravitational fields.
- (4.) (Electrical Engineer) The ability to incorporate these concepts into a working model.

- (5.) (Material Scientist) Expertise in state of the art nanotechnology may be of value to this team. Some of the initial experimental work might be developed at a sub-micron level since quantum effects are easier to detect at this level. Whether a nano-technology expert is needed on the team may depend on the route that the team takes to evaluate anti-gravitation.

In addition to their technical expertise, the team members will need to be very open minded in their approach to the problem and must be able to work well with others. A patent attorney should also be made available to the team so that any ideas generated that are directly related to this project or that could be used in other fields, are patented. One of the team members, or another individual, will need to be selected as a team manager that can use brainstorming techniques and other open-minded methods to help the team develop their ideas. This individual will be the driver and motivator of the team and may be the most critical person to the success of the team. This individual does not need to be the strongest person technically on the team, but this individual's technical expertise must be sufficient to understand the basic concepts that the team will be addressing.

Once the team is selected, the next step will be to develop a project plan. Because this type of research can change its character due to discoveries, the milestones should be flexible and should be developed by the assembled team. An initial example of milestones for the beginning stages of this project could be as follows:

Week 0: Initiate hiring and selection process

Week 16: Identify team leader and complete hiring of key team members

Week 18: Team assimilation & brainstorming completed on next steps for anti-gravity project

Week 20: Team provides project plan to management with milestones for the next 6-12 months

- project plan identifies key gates that could affect change in direction of project

- project plan identifies necessary financial resources & additional manpower if needed

- project plan identifies how intellectual property will be captured in the process

REFERENCES

1843(a)(2)

1843(a)(2)