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Prospects for a Breakthrough in Field Dependent Propulsion

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PROSPECTS FOR A BREAKTHROUGH IN FIELD-DEPENDENT "PROPULSION"

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Abstract

If a breakthrough in space-time/field physics is achieved in the early 1980's, two advanced types of field-dependent "propulsion" systems could be developed and tested in the early 1990's. The two propulsion types are (1) Gravimagnetic Systems — multipurpose propulsion systems which utilize the "gravitational" effects of coherent electromagnetic energy configurations, and (2) Field Resonance Systems - deep-space propulsion systems which initiate extreme but localized changes in the nonlinear coordinate transformation properties of space-time ("hyperspace jumps"). Preliminary analyses of astrophysical systems support a new theoretical model which describes the space-time/field interactions utilized by these "propulsion" systems.

Introduction

A breakthrough in field-dependent propulsion systems is not more than 10 years away if the resources required to complete a breakthrough in field physics are provided within the next 3 years. The primary resource required is a special field physics laboratory which can be used to investigate and determine quantitative relationships between gravitational fields, magnetic and electric fields, and the basic structure of space-time. With a quantitative knowledge of these relationships, aircraft and spacecraft with performance characteristics far surpassing that of the Space Shuttle, the SR-71A (strategic reconnaissance aircraft), and the F16 (highly maneuverable fighter bomber) can be built.

Field-dependent propulsion systems will not utilise the propulsive momentum thrust which is required for current spacecraft and aircraft. These advanced systems will rely entirely on the use of internally generated electromagnetic configurations or patterns to alter the gravitational forces acting on the systems, resulting in the desired motion. Various theories or models have been proposed to describe these types of electromagnetic and gravitational force interactions, ranging from Einstein's extensive work on a unified field theory to the highly motivated and often innovative work of serious "amateurs."[1-3]

At the 4th Annual AIAA Mini Symposium at the NASA Johnson Space Center (March 30, 1979), the author introduced an advanced field-dependent propulsion concept based on recent thesis research and an anticipated theoretical breakthrough. At the 15th Joint (AIAA/SAE/ASHE) Propulsion Conference (June 19, 1979), a possible technological implementation of the concept was presented.[4] This concept and the preliminary design were introduced before a theoretical foundation was completely established to help stimulate interest in the pursuit of hydromagnetic research and technology and space-time/field interaction research (Fig. 1).

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The author has now completed an experiment-oriented theoretical model of space-time/field interactions which has been developed for use in a field physics laboratory. The model has similarities to "topological" models and theories independently developed by other researchers, which indicates that we are rapidly converging towards a new understanding of space-time/field interactions.[5,6]

Space-Time/Field Relationships

The new model of space-time/field interactions** will be used in this paper to describe the potential characteristics of electromagnetic/gravitational field interactions and the performance capabilities of two basic types of field-dependent propulsion systems. The model is currently undergoing revision which could alter the description of the interactions but which will not alter the expected effects of the interactions. The primary effects are as follows:

1. A decrease or an increase of the gravitational forces acting on a space-time mass or energy system (objects, planets, magnetic fields, etc.) by altering the basic space-time structure of the mass or energy system's energy pattern (can be accomplished by artificially generating a highly energetic spatially and temporally coherent energy pattern)

2. A decrease or an increase of the total energy in the mass or energy system by altering and fine-tuning its energy pattern to match or establish a resonance with the proposed "virtual" structure and patterns associated with a distant space-time point

3. The translocation of an object or space-time mass/energy pattern from one space-time point to another by altering the pattern to achieve a very precise resonance with a "virtual" pattern associated with a distant space—time point

While the author would prefer to wait until the model is complete and the results of initial experimental research are available before utilizing the model, he believes that the first steps toward the development of field-dependent propulsion systems must be taken in Fiscal Year 1981. The first steps are associated with the development of a field physics laboratory which can be used to investigate and quantify space-time/field interactions to achieve a breakthrough in our understanding of the relationships between gravitational and electromagnetic forces. Thus, the model is utilized in this paper to emphasize the point that a breakthrough in field physics can be achieved in the early 1980's if the required research is given a high priority in funding allocations and if a highly motivated well-qualified research team can be assembled.

**A. C. Holt, "Virtual/Space-Time Manifolds," being revised before publication.

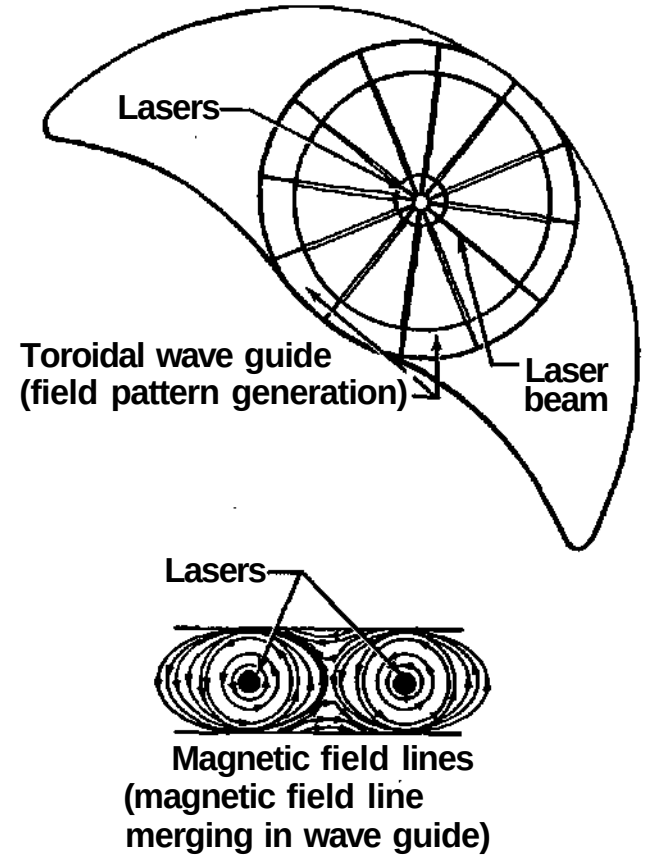


Fig. 1 Field resonance propulsion concept (winged disk).

Rather than develop another theory which would remain untested experimentally, the author developed a theoretical model which could be easily used in a field physics laboratory to investigate space-time/field interactions. If, as a result of the experimental testing, this qualitative model is basically confirmed, then a detailed mathematical description can hopefully be developed and the model will be upgraded to a mature theory. The nuclear physicists have used this type of experimental approach to make substantial progress towards the unification of the strong and weak nuclear forces (utilizing the experimental results of particle accelerators).

The model describes the gravitational force, electromagnetic forces, and mass (particles) as the variations of the characteristics of a continuous field of force. This field of force can be conceptually identified with Einstein's generalized tensor field which Einstein strived to develop to unify gravitational and electromagnetic forces in a single mathematical formalism. The field of force is defined by the interaction of space-time energy patterns (associated with particles, planets, stars, magnetic fields, etc.) and proposed virtual patterns which are associated with each space-time point and which form an underlying structure of space-time.

The virtual structure at each space-time point can be conceptually approximated by a series of virtual states or patterns. The virtual structure is actually a many-dimensional structure which transcends and permeates the four dimensions of space-time. A virtual pattern can be described if it is assumed that the pattern manifests as a space-time form. If these virtual patterns undergo a type of "energization" which results in a projection into space-time, patterns such as pulsating spheroids and ellipsoids and dipole, quadrupole, and octupole forms, etc., might result.

Symmetric Effects

Before moving on to the description of the field-dependent propulsion systems, there are two basic laws or effects which need to be discussed. If the differences between these two effects are well understood, the basic differences in motive force between our current propulsion systems and field-dependent propulsion systems will be understood.

To achieve the desired motion of the Space Shuttle, propulsive thrusts are generated to overcome the effects of the gravitational forces acting on the spacecraft and move the spacecraft into Earth orbit. The propulsive thrusts are provided by the two Solid Rocket Boosters, the three Space Shuttle Main Engines, and the two Orbital Maneuvering System Engines. The propulsive thrusts of the Space Shuttle's Main Engines are generated by combining liquid hydrogen and liquid oxygen, which results in the release of energy in the form of energetic molecules, atoms, and electrons. The momentum of these particles is channeled or redirected into an approximately linear plume or exhaust.

In the absence of gravitational and electromagnetic forces, this linear momentum would result in the imparting of equal and opposite momentum to the spacecraft (Fig. 2):

$$F + M(t)\, dV/dt = dm/dt\, u$$

where F = external gravitational, electromagnetic, and other forces

M(t) = decreasing mass of spacecraft

dV/dt = acceleration of spacecraft

dm/dt = mass loss in plume or linear exhaust

u = effective velocity of exhaust gases and particles

The basis for the balancing of linear momentum lies in Newton's Third Law, "For every action, there is an equal and opposite reaction," and in the principle of the conservation of linear momentum. These are fundamental characteristics of the physics of the universe.

These well-known lavs of physics are described in the model as the "symmetric" effect. The conversion of liquid oxygen and liquid hydrogen into matter with a lower energy state with the associated energy release can be described as the "energization" of a virtual pattern. The energization process intrinsically balances the linear momentum. Generating spacecraft motion by the symmetric effect takes advantage of the inherent property of the universe to maintain a balance of linear momentum. To utilize this balancing principle, considerable energy is expended and lost from the propulsion system.

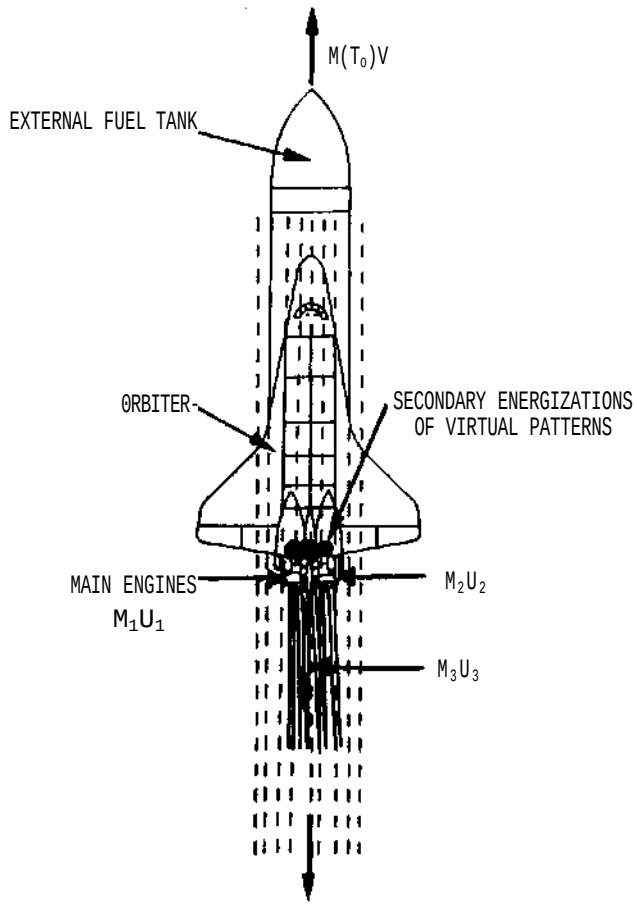


Fig. 2. Symmetric propulsion systems ($M(T_o)V = M_1U_1 + M_2U_2 + M_3U_3$).

The motion of planes, ships, cars, etc., is an example of the use of "symmetric" effects. In some cases, it is more difficult to sort out the external forces and the balancing of the linear momentum.

Asymmetric Effects

While symmetric effects are characterized by the balancing of linear momentum, "asymmetric" effects are characterized by unbalanced angular momentum systems. These systems include pulsating, rotating, and apparently static energy configurations. These energy patterns attract and repel other space-time patterns and virtual patterns forming a continuous interactive field of force. The attraction and repulsion forces of positively and negatively charged particles are the result of basic differences in the type and coherence of the energy patterns composing these particles. The coherence characteristics necessarily involve both spatial and temporal (time-related) descriptions. The energy gradients and energy flows of the patterns are fundamentally important in the determination of the type and strength of the pattern's interactions.

The interactive forces which are observed acting over large distances are called gravitational forces. The forces dominating over intermediate or microdistancea are known as electromagnetic and strong and weak nuclear forces.

These attraction and repulsion forces are described in the General Theory of Relativity as the nonlinear coordinate transformation properties of space-time. The same description is useful in the proposed model, although it is not necessary or desirable to try to give names to the different types of interactive forces between space-time energy patterns and the proposed virtual patterns. While the model has been left as general as possible to enhance its use in a field physics laboratory, it does imply that motion in space-time can be conceived as resulting from changes in the local nonlinear transformation properties of a particular region of space-time. Thus, while it appears to us that forces produce motion directly, the alteration of the nonlinear transformation properties may occur first, which results in changes in the space-time positions of masses and other space-time energy patterns.

In any case, the use of asymmetric effects involves the primary forces and structure of the universe. Since the interactive forces appear to be dependent upon the type and coherence of energy patterns, it should be possible to alter these forces by altering the energy patterns. Thus, if a system is designed which can artificially generate a wide variety of energy patterns which override the basic mass energy patterns of the system's structural elements, then it should be possible to neutralize or reverse the gravitational forces acting on the system by the selection of specific energy patterns. The alteration of the forces acting on the system results in the desired motion.

In an asymmetric propulsion system, the energy which goes into the pattern can be recycled and reused. The energy does not have to be dissipated as it is in the symmetric systems. The amount of energy required in the pattern to achieve a certain motion varies according to the type and coherence of the pattern. Some small energy loss is likely from these systems, however, since a perfect recycling technique is not likely to be achieved.

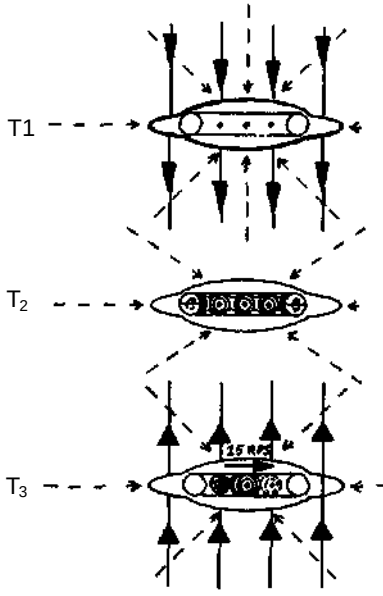
Since asymmetric systems do not use an external force to propel them, the term "propulsion" is no longer an accurate adjective. However, to avoid confusion, the term will continue to be used in the remainder of the paper, generalizing its meaning to include any transformation from one space-time point to another.

Asymmetric propulsion systems will have performance characteristics which will surpass by orders of magnitude those capabilities associated with current propulsion systems. Since we now have the technology to artificially create highly energetic coherent electromagnetic energy patterns, experimental confirmation of the characteristics of asymmetric effects can now be initiated. Confirmation of these effects will lead to the development of field-dependent propulsion systems (Fig. 3).

Field-Dependent Propulsion Systems

Coherent Field and Energy Generation System

Following a breakthrough in space-time/field interactions, two basic types of asymmetric propulsion systems will likely be developed. Type 1 is



S_1 - 100% SUBSET OF E_1

RESULTANT FORCES

SAME AS EARTH GRAVITATIONAL FORCE

S_2 - 50% SUBSET OF E_2,
50% SUBSET OF V_2

RESULTANT FORCES;

SPACECRAFT/EARTH REPULSIVE FORCE BALANCES VIRTUAL/EARTH ATTRACTIVE FORCE

S_3 - 90% SUBSET OF V_3
10% SUBSET OF E_3

RESULTANT FORCES;

SPACECRAFT/EARTH REPULSIVE FORCE DOMINATES

VIRTUAL/SPACE-TIME INTERACTIONS OF SPACECRAFT

VIRTUAL/SPACE-TIME INTERACTIONS OF THE EARTH

E_0 - SPACE-TIME ENERGY PATTERNS OF EARTH

S_0 - SPACE-TIME ENERGY PATTERNS OF SPACECRAFT

V_0 - VIRTUAL ENERGY PATTERNS ASSOCIATED WITH SURROUNDING SPACE-TIME POINTS

Fig.3 Asymmetric (field-dependent) propulsion system (front view of winged disk).

a "gravimagnetic" system which utilizes specific electromagnetic energy configurations to generate an artificial gravitational field (in effect). Type 2 is a "field resonance" system which relies on the use of electromagnetic energy configurations to establish precise resonances with virtual energy patterns at distant space-time points. These space-time "form resonances" result in "jumps" or translocations of the spacecraft/aircraft to the distant points.

In order to describe these two types of field-dependent propulsion systems in more detail, preliminary designs of these systems are needed. While significant differences between these two systems are expected, for the purposes of this paper, one common design will be used to describe both propulsion types. The design which will be used is known as the Coherent Field and Energy Resonance System (CoFER5)[7,8] which has been developed as the central element of a field physics laboratory but which could also find use as a prototype of a field-dependent propulsion system.

The CoFERS utilizes a toroidal-shaped energy guide with megagauss magnetic field sources located along radius vectors equally spaced around the toroid (Fig. 4). The megagauss magnetic fields are generated by superconducting magnets (or by laser/field generation effects as observed in fusion research) in a cylindrical pattern along the radius vectors. As the magnetic fields expand out from the sources, they interact through the magnetic field line reconnection process (Fig. 5).

In the field line reconnection process, oppositely directed magnetic fields and plasma are forced together, causing a breaking and reconnection of field lines or lines of force. As a result, some magnetic energy is converted into kinetic energy and incoming "frozen in" fields and plasma are redirected at an angle of 90° from their initial direction. Thus, the field line reconnection process can be used to configure the fields and plasma into certain energy patterns or configurations. The pattern precision achievable with such a technique might be sufficient for the gravimagnetic propulsion system, but it would not be sufficient for the field resonance system vhere exact form resonance with virtual patterns of distant space-time points is required.

In a research study completed in 1979,° it was determined that oscillations of magnetic field lines could enhance or inhibit magnetic field line reconnection. The effect of these hydromagnetic waves is dependent on the wave frequency, wave length, wave amplitude, and wave orientation with respect to the field lines. By varying the wave characteristics and the strength and duration of the magnetic field source pulses, and by sequencing these field pulses, a wide variety of energy patterns with a high degree of spatial and temporal coherence can be generated (Fig. 6).

Gravimagnetic Systems

To alter the gravitational forces acting on an object, the model requires that its energy pattern be substantially altered; its energy flux density must be substantially increased in most cases. The object's energy pattern is defined by the energy equivalence of the mass distribution combined

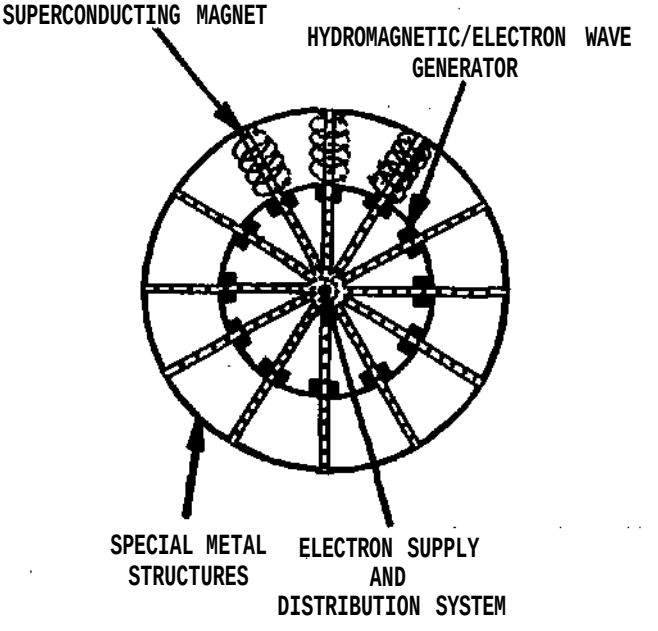


Fig. 4 Coherent field and energy resonance system (top view).

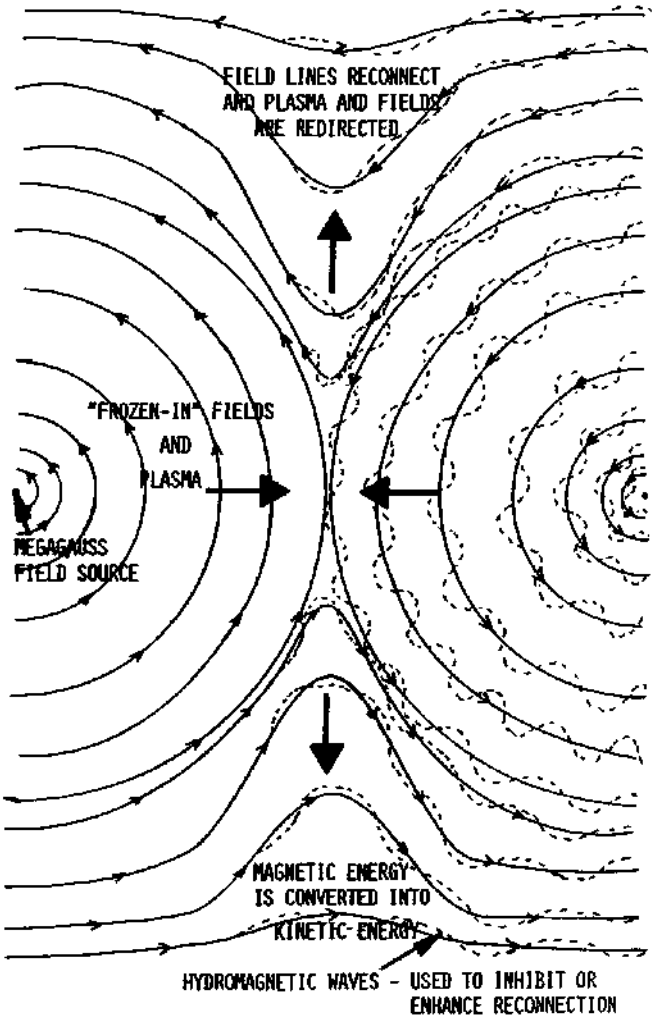


Fig. 5 Magnetic field line reconnection and hydromagnetic waves.

with any additional energy pattern, such as a magnetic field. To alter the object's composite energy pattern, a new energy pattern must be created inside or outside the object (or an existing energy pattern must be substantially altered).

By converting the object's normal space-time energy pattern to an energy pattern which differs substantially from the normal pattern, the gravitational forces acting on the object are changed. The object's new pattern interacts with surrounding space-time and virtual energy patterns such that the interactive forces are substantially altered. The alteration of the characteristics of the continuous field of force results in the apparent motion of the object through space-time. The notion appears to be due to an increase, decrease, or reversal of the gravitational field the object is initially affected by.

The effectiveness of the additional energy pattern in altering the forces acting on a spacecraft or aircraft is much more dependent on the type and configuration of the pattern and its precision and coherence than on the amount of energy in the pattern. In other words, above a certain threshold, which is dependent on the mass and shape of the spacecraft, a repulsive "gravitational" force (for example) is increased much more quickly by altering and/or fine-tuning the energy pattern.

The performance characteristics of such a spacecraft/aircraft would exceed by orders of magnitude the performance capabilities of current spacecraft/aircraft. Since the gravitational forces acting on the propulsion system can be quickly altered to achieve the desired motion, the spacecraft can make right-angle turns at very high velocities without adversely affecting the crew or system elements. The effective gravitational field the spacecraft/aircraft experiences can be nearly instantaneously reoriented at a 90° angle, resulting in a smooth continuous motion as far as the occupants are concerned. In addition, acceleration capabilities are limited only by the propulsion system's ability to alter the total energy flux density and energy configuration of the spacecraft. The greater the difference between the new and normal energy pattern of the spacecraft, the greater the acceleration. Or from another viewpoint, the closer the new pattern matches the surrounding (or distant) virtual patterns, the greater the acceleration away from a normal mass pattern such as the Earth.

While acceleration can be achieved without the presence of a large mass such as the Earth, the gravimagnetic system is perhaps best suited for use in and around such mass systems. Thus, since deep-space travel would not normally be a requirement for such a system, it could be designed fairly simply with comparatively small dimensions.

In the design of a field-dependent propulsion system, the energy storage or supply system will most likely be the most formidable design task. Since asymmetric propulsion systems do not need to

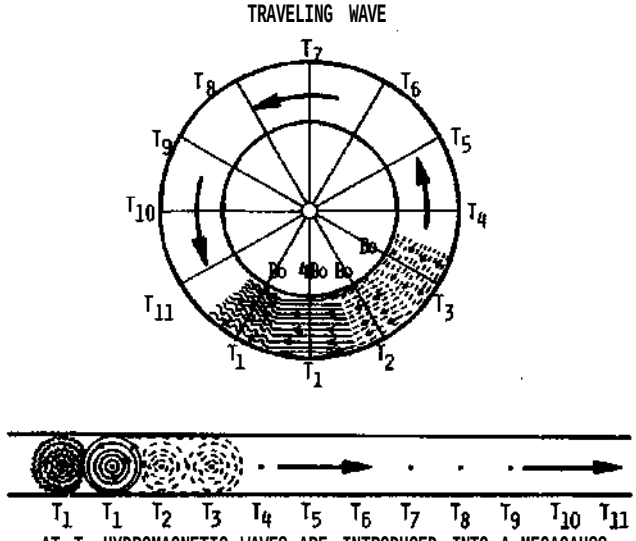


Fig. 6 Typical energy pattern (rotating field/ energy pulse).

dissipate energy to produce motion, the energy utilized in the generated patterns can be recycled and reused. Thus, a system capable of storing a large amount of energy with a very low energy loss would be the design goal. Storing energy in very high magnetic and/or electric fields utilizing superconducting materials or other types of field "capacitors" may be an efficient approach. Conventional energy sources, including nuclear energy, could be utilized for certain types of air transportation, but they would probably not be sufficient for high-performance systems. If the fundamental and secondary resonance effects described in the next section are experimentally confirmed, energy storage systems could be recharged by energy flows between space-time points (resulting from resonance effects).

Field Resonance Systems

While the gravimagnetic system is likely to be the first field-dependent propulsion system developed, the field resonance system will bring stellar and galactic travel out of the realm of science fiction. The field resonance system artificially generates an energy pattern which precisely matches or resonates with a virtual pattern associated with a distant space-time point. According to the model, if a fundamental or precise resonance is established (using hydromagnetic wave fine-tuning techniques), the spacecraft will be very strongly and equally repelled by surrounding virtual patterns. At the same time, through the virtual many-dimensional structure of space-time, a very strong attraction with the virtual pattern of a distant space-time point will exist. The model predicts that this combination of very strong forces will result in the translocation of the spacecraft from its initial position through the many-dimensional virtual structure to the distant space-time point.

The mechanics of this resonance effect will be determined through extensive experimentation, which may also revise the basic resonance requirements. However, the result, a space-time "jump," already appears to be supported by astrophysical research. Several analogies can be used to clarify this effect. It can be described as the temporary formation of an Einstein-Rosen bridge, a tunnel through space-time which connects two different regions in space-time in a way similar to that which has been proposed for a black hole/white hole (quasar) connection. The resonance effect can be considered to be analogous to the nuclear particle tunneling phenomena. In this phenomenon, the wave nature of the particle enables it to tunnel through a potential barrier without having the energy required to go over the barrier. Following this analogy, the spacecraft's wave characteristics are increased dramatically by the artificially generated energy pattern, allowing it to tunnel through the space-time barrier without having the energy normally required to traverse the space between the two space-time points.

The travel times for such trips are expected to be short (seconds to weeks) and dependent on the pattern precision, the amount of energy in the pattern, the space-time distance, and the virtual structure entry point. Time does not have on independent existence in the General Theory of Relativity and it will be redefined in the model as a type of energy flow. However, since time will continue to be used to catalogue our experiences in daily life, its use is likely to continue in the description of this type of long-distance travel.

If the artificial energy pattern does not precisely match the virtual pattern at a distant space-time point, a secondary resonance effect may be observed. In this case, the repulsive and attractive forces are not strong enough to relocate the spacecraft, but the resonance is sufficient to connect the two points through the virtual structure, resulting in an energy flow to or from the distant space-time point. By the selection of appropriate pattern characteristics, the energy pattern can gain energy which can be simultaneously transferred to energy storage and supply systems. For field resonance spacecraft going outside the Earth/Moon system, this technique for maintaining the energy supply could be very useful.

The energy recharging process could be accomplished as a preparatory procedure prior to the initiation of the primary resonance. At a particular stage of the fine-tuning process, the energy pattern could be put into a hold, allowing the pattern to acquire additional energy and charge the energy storage device. At the same time or even preceding this stage, information in the form of the characteristics of energy decreases or increases (space-time energy spectral data) might be used by a sophisticated guidance and control system. The system could use this information to compute final fine-tuning requirements and to verify the location of the virtual pattern's space-time association. While these ideas are quite speculative, they do point out that there are potential technical solutions to problems which might otherwise seem to prohibit such travel.

In order to explore a star system midway from the center of the Andromeda galaxy, several intermediate space-time jumps would likely be required for safety purposes. The initial jump would take the spacecraft into interplanetary space away from known asteroids and meteor showers. The next step would be a jump to interstellar space, followed by a jump to intergalactic space, then by a jump to a star system on the edge of Andromeda, then to a point at least 500 million miles away from the desired star, and finally a couple of million miles away from a planet. At each step, the predicted and actual locations would be compared and computerized models would be updated accordingly. Exploration of a planet would probably be best done by a gravimagnetic system which could be carried inside the larger field resonance system.

If the energy pattern generation system of the field resonance spacecraft has an ultrafine-tuning system, space-time jumps to nearby positions could be accomplished. If the spacecraft made frequent and very short jumps, it would appear in many cases to be in a smooth continuous flight through space-time.

Prospects for a Breakthrough

Field Physics Laboratory

To build and test the gravimagnetic and field resonance propulsion systems in the late 1980's and early 1990's, a breakthrough in our understanding of space-time/field interactions is required

in the early 1980's. A well-focused project-level effort will be required to achieve any breakthrough in the next 5 years. The author and other researchers believe that a breakthrough can be achieved in that time if a highly motivated research team can be assembled and if a suitable field physics laboratory is developed.

If some initial studies are started in Fiscal Year 1981, then the subsequent theoretical work and additional experimental research will be geared to support the start of facility development in Fiscal Year 1982. The substantial cost of this project will mean that significant experimental evidence pointing to a breakthrough will be required. If the field physics laboratory can be completed by the end of 1982 or early 1983, extensive confirmation of a breakthrough and the quantification of associated field and space-time relationships should be achievable within 3 years (1986).

Field-Dependent Propulsion Systems

If sufficient justification exists to start the development of a field physics laboratory, it should not be unreasonable to initiate, in Fiscal Year 1982, Phase A studies of field-dependent propulsion systems (gravimagnetic and field resonance systems). Early studies of these systems are essential to stimulate the development of the new materials and technology required to build these systems.

The new materials which will be required include materials with superconducting properties at higher temperatures than now available, materials with varying degrees of magnetic susceptibility, and materials with reradiation characteristics and other characteristics related to energy pattern formation. The new technology required will include a coherent field and energy generation system using hydromagnetic interactions and/or other techniques; efficient field energy/current recycling subsystems and techniques; compact megagauss magnetic field sources with extensive pulse profile control capability; sophisticated guidance and control systems using field, current, and energy pattern feedback systems; and advanced display and control concepts (holographic displays could be necessary).

The Tide

"There is a tide in the affairs of men which when taken at its full leads to . . . ." So goes the well-known advice. The tide is high now for an all-out attempt to achieve a breakthrough. The breakthrough will greatly enhance our defense posture and will substantially help in overcoming our energy problems. World events could inhibit or make such an effort much more difficult later in this decade. Let's not miss this high tide. In less than 10 years, we landed men on the Moon; in less then 10 years, we can achieve a breakthrough in field-dependent propulsion.

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