# A Study on Temporal Warp Field Mechanics

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***Abstract*—A look into how current warp theory can be applied to a many-dimensional model in order to make possible the translation of objects along the fourth dimension. This paper explores how such a process could be achieved in practice, as well as the underlying principals behind the transition assuming only base knowledge of warp theory.**

## I. Introduction

WARP theory has been used for over 200 years in order to bend spacetime. Typically, this is used to bend the three spacial dimensions in a bubble, such that the bubble moves at FTL speeds, and the object maintaining this warp field also moves along with the bubble. This allows rapid movement throughout the universe, and is seen in practice in most interstellar ships today.

However, such a bubble has never extended to warping the fourth dimension, that is, time. However, it is possible to do so, and follows a similar theory to normal warp theory as described by the Huris Equations [1].

In this paper, we will explore this possibility, and how it fits within the current field of dimensional analysis.

## II. Summary of Theory

### A. Warp Bubble Temporal Manipulation

In standard warp theory, the three spacial dimensions are used. The idea of the theory is that space is stretched, so a small movement in any of these dimensions leads to a large movement relative to other objects in space. This allows FTL speeds. However, this stretching can also occur to the fourth dimension, time. As we know, all objects act relative to this fourth dimension - that is, 'move constantly through time'.

This means if a warp bubble is creates that also stretches the time dimension, the rate at which you perceive time will be much faster relative to the rest of the universe. You will create a 'tunnel' which will cause you to swiftly move to the future. This is not observed in typical warp bubbles as the bubble must be extended in this axis as well to cause compression in it.

This is the same effect as would be achieved by typical near-lightspeed travel under the theory of relativity [2], however - unlike special relativity - not requiring high-speeds relative to the surroundings.

### B. The Warp Singularity Effect

However, this begs another question - if travel through the time-axis at accelerated rates is achievable via warp-bubbles, is it also possible to reverse that, allowing one to travel against the 'flow' of time. The answer to that is yes, but is more difficult to prove.

Suppose you had a stable symmetric warp bubble, and you compressed the interior of that warp bubble to a single point. In the centre of this bubble, it would be possible for the spacial axis to turn back on itself, causing one travelling through the outer bubble to return the way they entered by only moving forwards. The space overlaps so it is possible for two coordinates in an inertial frame to be the same point on space-time.

Applying the same principal to time, we can stretch this point over the fourth dimension to create a reverse flow of time. Entering this outer bubble will cause you to end up in a time coordinate before when you left.

We will refer to this point as a *Warp Singularity*. Keep in mind that warp bubbles contain both an inner and outer edge, and this singularity refers to the phenomenon where the inner edge collapses, while the outer edge has no such restriction.

## III. Formal Theorem Analysis

### A. Original Theorems

The phenomenon described above can formally be presented in 3 main theorems. The first theorem argues that warp can take place over the time dimension.

*Theorem 1:* In a stable symmetric warp bubble $W = \{X, Y, Z, T, P\}$ with $X, Y, Z, T$ as dimensional compression maps and $P$ as a coordinate in frame $F$, there exists a point $t$ where $\frac{t}{t'} \neq 1$ iff $T \neq I$.

The second theorem argues that a warp bubble can be compressed allowing time to flow backwards.

*Theorem 2:* In a stable symmetric warp di-bubble $W = \{W_1, W_2\}$ where $W_2 = \{X_2, Y_2, Z_2, T_2, P_2\}$ with $X, Y, Z, T$ as dimensional compression maps and $P_2$ as a coordinate in frame $F$, then if $\forall D \in W_2, D[0] = D[1]$, and $W_1 = X_1, Y_1, Z_1, T_1, P_1$ with $T_1[0] = 0, T_1[1] = 0, T_1[P_2.t] > 0$, then $\frac{t_1'}{t} < 0$.

The final theorem addresses the problem of interference during time travel. Following practically the first two theorems, one can accelerate and decelerate their movement through time. However, if one were to do so, the image of warp bubble and the contents will be visible to inhabitants of the time being passed through. In addition, it would leave a permanent mark on that stretch of space-time, meaning it cannot be used for anything else. This can be solved using an inverse warp described in this final theorem.

*Theorem 3:* In a stable asymmetrical warp di-bubble $W = \{W_1, W_2\}$ where $W_1 = \{C_1, P_1\}$ with $X, Y, Z, T$ as dimensional compression maps, and a translation matrix $T : W_1 \to W_2$ then if $\forall P_1', P_2' \ st \ P_1' = T(P_2'), C_1[P_1'] \to \infty$ with $W_2 = \{C_2, P_2\}$, then $P_1.t \neq P_2.t$.

The meaning of this theorem isn't immediately obvious, but it states that if the outer bubble never allows dimension compression with the inner bubble, that inner bubble cannot be in the same time coordinate as the outer bubble in any frame. The results of this, are that the coordinates of the surrounding space-time are warped by the outer bubble such that it is impossible to observe the inner bubble. However, this also means the reverse it true, and the inner bubble cannot observe any time period other than the one their outer bubble was originally formed within until a fourth-dimensional anchor has been set.

### B. Proofs of Theorems

*1) Theorem 1:* The main notable aspect of this theorem is the introduction of a stable symmetric warp bubble of the form $W = \{X, Y, Z, T, P\}$. Previously, warp bubbles were given the form $W = \{X, Y, Z, P\}$ as seen first in the aforementioned paper [1], however if you follow the same form of proof as the Huris Dimensional Lemmas for the additional dimension, one finds that the same principle holds. See Appendix A for proof of this.

*2) Theorem 2:* Theorem 2 is more tricky to prove. If we consider that $\frac{t'_1}{t} < 0$ must be true, we find that this only occurs when $\exists x \ st \ D[x] < 0$. By making use of the Lorenz Factor $\gamma = \frac{1}{\sqrt{1-\frac{v^2}{c^2}}}$ and the Hubris Rotational Factor $v = 2\pi r(f-\omega)$, we find that $\gamma^2 < 0$ at $v^2 > c^2$. Traditionally of course, this is impossible. But when combined with the Hubris Rotational Factor, we find that $|2\pi r(f-\omega)| > c$. Assuming that $f > \omega$, $r(f-\omega) > \frac{c}{2\pi}$. To see a practical example, with $r = 1$, then this would be true at $(f-\omega) > 4.3 \times 10^7$.

However, if there exists an $x \ st \ D[x] < 0$, that implies that $\int_0^1 D[x]p \ \mathrm{d}x < 0$ due to the Compression Flow Theorem [3]. Furthermore, this leads naturally to $D[0] = D[1]$, that is the compression is uniform and is across a single point in space, as Harlott explains that no two points in a compression field can have exactly the same compression properties.

Finally, we require the field to be access-able. This is done by linking to a second warp field $W_1$, which itself is subject to the flow of the inner field by the Hendrick Postulate [4]. This completes the proof. However, if we consider the energy balance bridging the two warp bubbles $E_1, E_2$, we find that such a procedure will cause an energy dis-balance, that is $\sqrt{\gamma_1\gamma_2}E_1 \neq E_2$. This 'lost/gained' energy would defy Energy Conservation, as there is now a total increase in the sum of energy $\int\int\int\int P(x,y,z,t) \ \mathrm{d}x \ \mathrm{d}y \ \mathrm{d}z \ \mathrm{d}t$

*3) Theorem 3:* Finally, theorem 3 introduces the element of isolation. $C_1[P_1] \to \infty$ occurs when $v = \infty$, or rather it has no velocity as $\frac{\delta x}{\delta t}$ where $\delta x > 0$ has $\delta t = 0$. This 'frozen time' state actually comes about when $f = \infty$ in the Hubris Rotational Factor, and can occur when relative to an external inertial frame, the frequency of the inner bubble is the same as the frequency of the outer bubble, causing the rotation to appear instantaneous to the outer bubble.

However, if the time relative to some inertial frame were exactly the same for the two bubbles, then the frequencies would overlap making the frequency seem to be 0 rather than infinite, as well as expanding the energy density of the di-bubble. If this does not occur, we can conclude that the time coordinates of the bubbles are not equal, that is $P_1.t \neq P_2.t$.

## IV. Conflict with Common Principles

### A. Causality Principle

The causality principle states that for every chain of cause and effect, the effect cannot have an impact on the cause. This would be violated if temporal lines intersected, allowing effects to impact the cause.

### B. Mass-Energy Conservation Principle

The mass-energy of a universe in any inertial frame must be constant at any time along that frame. This principle would also be broken as an additional object could intersect timelines, allowing extra mass into a previous time point.

### C. The Paradox Problem

As with causality, the act of breaking the cycle of cause and effect makes it possible for the effect to change the cause. If this cause then no longer causes the original effect, that effect could never occur, resulting in a paradox.

### D. Solutions to these Problems

Unfortunately, I have not yet solved these three problems. This suggests there is some lacking element to their underlying theory incompatible with these new theorems. This should be an area for future research, as it is unknown what would happen if a drastic violation to any of these were to occur.

## V. Practical Application

### A. Thoughts on a Temporal Transfer Unit

The obvious application of these three theorems is to travelling to a point in the future and past against the natural flow of time. This is indeed possible, and has been proved via some rudimentary experiments.

The creation of such a device would require a stable warp di-bubble. The inner bubble must be compressed to a single point, which can be done by applying a higher harmonic pressure. This will require an exponential amount of energy, but it limited at $P = 2\int_0^R \frac{2\pi r^2 hc}{t\lambda} \mathrm{d}r$ where $R$ is the radius of the outer bubble. This would make power a concern for constant practical use.

Moving forwards in time is much easier, and would simply need to extend the warp bubble into the 4th dimension. This can be done by applying a delay to the warp flow components. This will still create the warp field, but the compression will be extended over more sparse points in time.

### B. Application of Theorem 3 to Spacial Concealment

Theorem 3 describes the ability to hide an object inside an inner bubble, using the other bubble to bend space around it. This works extremely well for temporal relocation. It may also be considered to be applied to concealment in a single time, but the issue with this is that an object cannot exist inside the inner bubble without having some form of space-time. As such, there must be a constant space-time flow for which the object exists within.

The consequences is that practically, where-ever you leave from when entering a warp singularity, until the point you intersect timelines, you will be visible still in the normal flow of time where you originated. In addition, you are unable to observe the time travelling to. Thus, there is no potential for using this theorem in any kind of cloaking device.

### C. Stationary Field Application

Another application of Theorem 1, is that one can stretch out time across the warp bubble, causing time to move slower. This would allow one to spend time within the warp bubble with little to no time passing outside. This could be useful for making quick decisions or learning in an instant.

## VI. Future Work

### A. Testing of Theorems

While these theorems have been proved using maths, they should also be thoroughly tested to ensure they are correct, and to take note of any potential unconsidered side-effects as a result of them.

### B. The 5th Dimension

During the proof for Theorem 2, we found that the energy across all points in space has changed - that is, energy was able to enter the universe somehow at the point in time one begins the temporal relocation. Normally, the total energy in space for some time can be calculated by summing the energy input of all sources, the only source being from space an infinitesimal point in time before the current point. The ability for that total energy to change suggests that this must also enter and exit from an additional dimension. However, as we can observer that dimension is not time, it must be considered possible that there is a 5th dimension the energy originates from.

The implications of such a dimension would be widespread, and is an area that should be experimented with more in the future.

## VII. Conclusion

During this paper, I have shown how extending warp through the temporal dimension allows said warp bubble to compress time. I have further explained how a warp singularity can be created to allow travel to the past and future relative to the initial inertial frame, and how careful use of this can allow one to remain invisible to the outside world as they travel.

Furthermore, I have show that this allows one to create a device capable of travelling through time, but there remain complications in terms of long-held principles that must still be resolved to understand the implications.

In addition, there is evidence that a 5th dimension exists that expands beyond our universe, which absorbs some amount of the energy put into time travel facilitating its feasibility.

This theory has been tested and proved to allow sending objects to the past, and opens up a new spectrum of study in temporal mechanics.

## Appendix A
## Proof of the Hubris Dimensional Lemma for the Fourth Dimension

The proof for the Hubris equation of time can be found similarly to the others by simply considering the two equations $\Delta t' = \int_a^b T[x]t' \, \mathrm{d}x$ and $\Delta t = \int_a^b I[x]t \, \mathrm{d}x$. These come of a consequence of the definition of a dimensional compression map. In this case, $I$ is the identity map, while $T$ is the dimensional map for time in the new frame. Observe that if $I \neq T$, then $\frac{t}{t'} = \frac{\int_a^b I[x]t \, \mathrm{d}x}{\int_a^b T[x]t' \, \mathrm{d}x} \neq 1$ for some $a, b \in \mathbb{R}$. This can be proved by contradiction - if there is no range they are different, then there must be no point as which measuring with give a different compression between $T$ and $I$. But this means $T = R$, contradiction.

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