# On Particle Movement within the Field of Universal Matter

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## 1 Review of the Philosophy

In the Natural Philosophy of Universal Matter, herein the Philosophy, the described processes were characterized as interactions between members of the set of all particles of Universal Matter. The set is denoted as {f} and constitutes a field of particle matter. The set of Universal Matter and the field of Universal Matter will be interchangeably referred to as {f}. Particles X and Y are members of the set {f}, such that X is in motion and may collide with Y. The results of the collisions may be characterized as such:

- Due to the irregular shapes of the particles X and Y, the two particles may collide with each other and remain together forming a single composite particle. The collision of X with Y may introduce rotation in the resulting composite particle; or
- Or the two particles X and Y may collide, separate, and remain two discreet particles of {f}.

In either case there may be one additional result of the collision:

- It may cause small pieces of either X or Y, or both, to break off and becoming separate 'sub-f' particles. As a result of the collision and breakage, some of the energy of their parenting particle may be transferred to the new sub-f particle.
- As newly formed sub-f particles of {f} are created, they become member particle(s) in the set {f} and, as such, fill-in the spaces in and around their parenting particles forming a localized influence on neighboring particles and other sub-f particles.

Given these results we can work backwards in time and conclude that the original state of the field {f} was a 'fog' of individual particles. This original state represents a Standard Distribution[1] in the field {f}. We can also work forwards in time and conclude that the collisions will result in ever-more complex, composite particles. This later state represents Composite Distribution in the field.

## 2 Distribution of Matter Within the Field

The distance of any one particle of {f} from its neighbors underlies the discussion of Standard versus Composite Distribution of matter within the field. Let's setup a three-dimensional axes x, y, and z, at any such location in any such area of Standard Distribution of field matter. Here we will consider that one particle, say 'P', is placed at the junction of the three axes.

### 2.1 Standard Distribution

In this distribution, when we consider the distance of P to any one of its neighbors. In Standard Distribution we will find that the average distance of P to any one of its neighbors to be very nearly equal to any one of these measured distances. If we continue to replace P with any other such particle of {f} and then measure distances to its neighbors, we find that any one measured distance or the average of such distances is essentially equal those done for P. Thus we find that Standard Distribution of {f} matter is largely homogeneous.

### 2.2 Composite Distribution

Composite particle joining behavior among members of the field of {f} is detailed in the Philosophy. In some areas, composite joining continues at large, forming vast areas of composite particles. Large quantities of atoms and molecules form. These are particles may be gathered into much larger compositions, ranging from space dust to asteroids, from small planets to large gas giants, and stars to galaxies.

[1] Or Default Distribution

Let's consider a star and place the x, y, and z axes at its center. Let's then take our particle P and place it at the center of the axes. Again, we measure the distance between P and its neighbors. Now let's move P further out on one of the axes, say the x-axis, as $P_x$. Once again we take our measurements but find different results: The average distances around $P_x$ to its neighbors is greater than those measured for P. As we continue to move outwards on the x-axis, and we repeat this operation, say for $P_{x+1}$, the average distances from its neighbors will always be greater than for $P_{x-1}$. The greater the distance we move $P_x$ outwards on the x-axis from our origin P, the measured distances become closer to that of Standard Distribution.

### 2.3 Combined Distributions

The Philosophy leads us to conclude that {f} field particles and regular astronomical objects are related. Our visible universe is composed from Universal Matter. The relationship of quantity is direct: Areas with greater quantities of regular astronomical objects will be found in areas with a greater amount of Universal Matter.

Main areas of composition, say a planet such as ours, has a dense, but far from solid, concentration of Universal Matter at its core. But as one moves outward away from the planet center, the concentration of field matter drops to levels found in (or at least closer to) areas of standard distribution. The gradient distribution of field matter from the center of the large areas of composite distribution to distant areas of standard distribution is a key component of field distribution. It also provides a key aspect of particle movement within the field.

These two distributive models of {f} particle matter form one of two required concepts when discussing particle movement in the field. The second concept is the movement itself: How does this movement come about and what is its source?

## 3 Energy

### 3.1 Basis in the Philosophy

The Philosophy holds several examples of particles and their dimensions of conductance and rotation:

- As sub-particles of {f}: As small bits of a particle break-off during joining activity it remains spinning and in motion holding on to the momentum imparted from the collision of its parent {f} particles;

- As additional particles of {f} join in Composite Particle Level I compositions[2], the additional collisions impart rotational energy to the developing particle;

- As subsequent levels of joining collision energy is transferred to rotation;

- As series joins transfer rotational energy to conductive energy. This energy is then later used in joining between effective and ineffective Prime Particles; and

- As quantitative joins transfer energy to the small particles used in the join such that some remains with the larger particle in a gathering cloud of conducted particles.

From this we see that composite particles gather, store, and use energy from the collisions that cause and build them. In the Philosophy, energy -

- Can be held in rotation around a composite particle,
- Found in a particle's energy interface, or
- Transferred to a new composite particle

### 3.2 Basis of Energy

Energy is physical movement of a non-physical body through the field {f}. This movement may or may not include a particle but, if included, the particle is not directly part of the movement: It is energy that moves through the field and the particle is carried by the energy. The movement of energy is accomplished through a series of rotations of field matter. Energy moves forward (in the direction of travel) by establishing new rotations[3] in the front (in the direction of travel) and leaving the old rotations to fold back into ambient field conditions. Energy moves in the direction of travel but, other than rotation, field particles do not move forward.

The movement of energy is not free. Some of the energy is spent in its efforts to spin-up new rotations of field matter. At the field level, the transfer of energy from one rotation to the next, new rotation is extremely efficient - but it is not perfect. Some of the particles of energy held in rotation fail to spin-up fresh field matter and fold back into the field. Regardless of the strength of the energy wave's breadth and depth, it diminishes over time and, inevitably, will come to an end and its matter will settle back into the field.

[2] See the Philosophy for the definition of this type of particle
[3] Via quantitative joining behaviors

Let's consider that some event, perhaps burst of matter from a star, imparts energy to the field. The event, though viewed as a single, large event to us, is not a single expression of energy in the field, rather the energy is expressed as a number of much smaller, localized events at the field level. The number of local events correlates to the breadth and depth of the predecessor event's total energy. Let's detail one of these local events.

Each local event is comprised of a series of rotations which vary in size within a drawn-out elliptical shape as illustrated in Figure 1. As the event moves in direction 'D', it uses it's pool of energy to build rotations and transfer energy forward. As the energy of the event moves forward, the energy rotations in it's wake decay and lose any energy it has left.

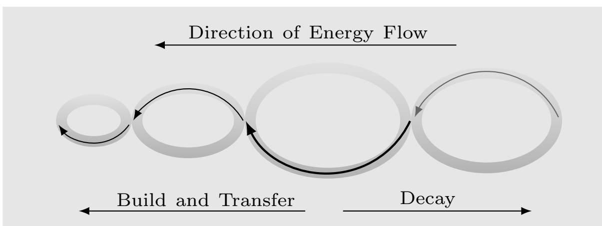


Figure 1: Energy Rotations Moving Through the Field

Now, let's consider that a physical body, in addition to the energy, is included an energetic event.

### 3.3 Composite Particle Structure

Energy, as noted in Figure 1, moves as a group of local rotations of field {f} matter. When a composite particle expresses energy, there is a correlation of these particles to local energy rotation field events. Here the group is expressed as a sub-group of particles and each one correlates to a local rotation event. Let's take a closer look at a typical composite particle better understand this relationship.

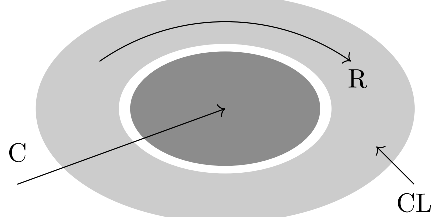


Figure 2: Composite Particle with its Conducted Shell

Figure 2 illustrates the core (C) and rotating conducted particle layer (CL) matter held in rotation around a composite particle. The direction of rotation (R) in the conducted particle layer (clockwise in this illustration) is arbitrary.

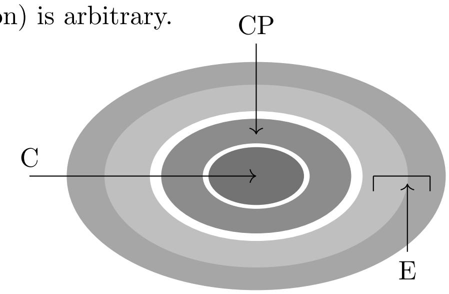


Figure 3: Adding the Energy Shell

Figure 3 adds the energy particle layers, labeled E, to the particle. It rotates in the same direction R as found in Figure 2. The energy layer has inner and outer sections of layered of the particles. The rotational velocity of the inner energy layer best matches the velocity of the CL layer. The outer layer acts as an intermediary between the particle and the field {f}.

The conducted particles held in the E layers is indicative of the total amount of energy held by the composite particle. However, given that an energetic event affected the body, the energy of the composite particle and the energy wave is integrated and created at the same time.

### 3.4 Integrated Energy and Particle

As it moves forward in direction D, the composite particle finds its place within the primary (largest) energy rotation illustrated in Figure 4. The rotation of the outer energy shell, as noted by arrow, interacts with the rotation particles in the same direction of rotation.

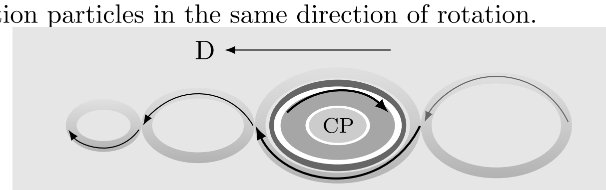


Figure 4: Integrated Energy and Particle

The energy wave and the composite particle are now fully integrated. The combined energy is held in the outer layers of composite particle and in the energy wave rotations. The greater or lesser amounts of conducted matter in these forms indicate the amount of energy available to the energy wave/particle.

Expression of the event in the combined energy wave/particle is not always successful. Less than 100% of the energy that caused the event is transferred to the (new) energy wave/particle. For example, the composite particle may not find a compatible energy waves in which to reside and both parts are lost to the field. Or, as an energy wave begins to assemble, it gets mixed up within itself, fails, and folds into the field.

# 4 Particle Collision

Movement is caused by some precipitating event, such as a push of energy or one body colliding with another body. Let's focus on the latter and, to aid in the discussion, we'll consider two particles:

- One that will play the role of a **predecessor particle ($\mathbf{P_p}$)**; and
- A second particle which plays the role of the **successor particle ($\mathbf{P_s}$)**.

Now imagine that $P_p$ collides with a stationary successor particle $P_s$. Let's look at how $P_p$ causes motion in and transfers energy to $P_s$. To do so, let's redraw Figure 4 and add a successor particle.

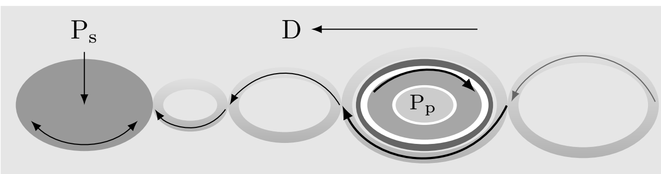


Figure 5: Adding the Successor Particle

The leading energy rotation of $P_p$ first contacts $P_s$. $P_s$ then begins to 'hunt and peck' for best fit as it processes through the leading energy rotations of $P_p$. As it progresses through the energy rotations of $P_p$, $P_s$ tries to find an energy rotation of $P_p$ that is rotating in the same direction and whose energy rotation is the same size or larger.

This discussion presumes that $P_p$ has sufficient energy to engage and deflect $P_s$. If not, the two particles will collide and pursuant actions will subside and settle back into the field. A successful collision will find that the energy wave of $P_p$ will capture $P_s$ in one of its energy-rotations that is fit to pick up $P_s$ in an energy wave.

## 4.1 An Energy Wave

Figure 6 represents $P_p$ colliding with $P_s$[4].

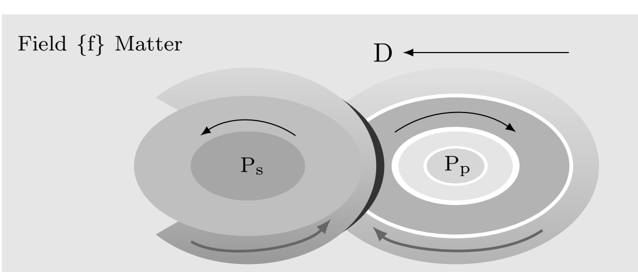


Figure 6: Impact

[4]Figure 3 illustrates the configuration details of $P_p$

For the sake of simplicity, we'll presume that the best fit for $P_s$ is in the predecessor's energy rotations is the one next to $P_p$. It may be, however, in one of the earlier energy rotations found in the direction of travel.

In either case, $P_s$ is rotating in the opposite direction as the $P_p$'s energy rotation. The rotation forms a wave of rotating matter against $P_s$ and, given enough energy in $P_p$, will begin to carry the successor particle in direction D. Two subsequent actions occur:

- The energetic flow from the conducted matter flow of $P_p$ rolls against $P_s$. This flow forms a wave rolling and pushing $P_s$ in direction D; and
- $P_p$ is in motion and, in the collision with $P_s$, forms an indentation in both its outer and inner shells. This action compresses the energy shells of $P_p$. The compression acts as a spring adding to and increasing the push against $P_s$ outward in direction D.

$P_p$'s energy wave forms a rolling wave of conducted matter transferring energy to $P_s$ by initiating and increasing the speed of rotations in the successor particle. $P_p$ also transfers energy to $P_s$ through its spring-like pushing away from the collision. As $P_s$ accelerates away from $P_p$, it brings its new inner shell up to speed with its conducted energy shell and, given enough transferred energy from $P_p$, begins collecting energy by adding conducted matter from the field to its inner and outer shells, and by developing its own energy wave of rolling matter. Due to the combined energetic actions of $P_p$, $P_s$ springs away in direction D.

This energetic action also affects $P_p$. Its spring energy action pushes back in the opposite direction of D. This may cause $P_p$ to move more slowly in direction 'D', to stop, or to rebound in the opposite direction. Both particles, however, pay a price and lose energy to the field.

## 4.2 Movement Through A Standard Distribution of Field Particles

$P_p$ and $P_s$ are examples of particles in motion in the field of {f}. Also, in previous discussions, we found that energy itself can and does move through the field. As noted above, in Figure 4, any such particle or energy wave, has an energetic series of rotating field matter preceding it as it moves in any such direction. Let's now term this preceding series of rotating field matter as an 'interface' to the particle/energy wave as it moves through the field.

The interface is and is not persistent. While it precedes the particle/energy wave and rotates field matter, the rotating field matter does not travel along with the particle/energy wave. The interface is always transferring the energy wave rotation to new field matter. The particle (if there is one) then moves into the space of the interface leaving the previous rotation to settle behind it.

Consider that field matter in the leading rotation of the interface is slightly bowed outward as illustrated in Figure 7 and moving in direction D. As noted in other discussions, the standard distribution of particles in the field is homogeneous, illustrated as a flat, light gray background. In this scenario, the average distances between the interface and the field are viewed as the darker gray fill between the plotted values for the particle/energy wave and the field.

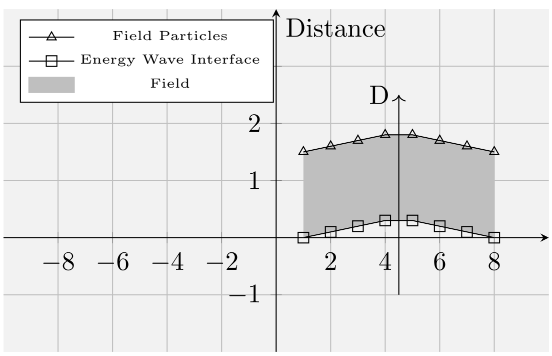


Figure 7: Standard Field Distribution

Note that the distance between the interface and the field, that is the darker gray fill, is the much the same across the interface. This means that there is an equal ability of particles on the leading edge of the interface to attempt to join with field particles, transfer energy to them, and add them to new interface rotations. The transfer of energy to the oncoming field is of primary importance for the particle/energy wave. But the interface's transfer of energy has a secondary effect on the particle/wave: It can change the path of the particle/wave.

In areas of standard distribution of field {f} matter, the interface's rotating matter might achieve a perfect one-to-one effort in gathering up approaching field matter into new energy rotations where each particle in the interface is able to induce motion into one particle in the field of {f}. But perfection is not achieved: The interface exploits regular joining actions to induce rotation in the field but not every field particle gets caught up in the join and the interface moves on to another particle. Or perhaps a field particle gets caught up but is then lost by the interface, that is energy used for no gain. And so it is, interface energy may be used and lost to the field.

This suggests that that the oncoming field matter offers some resistance to transferring energy to new rotations. The cost, though, is applied equally across the interface and no section of the interface sees more or less resistance. In this situation the effect on direction is negligible. This is not the case in areas of composite field distribution.

## 4.3 Movement Through a Composite Distribution of Field Particles

Figure 8 represents an energy wave (with or without a particle) moving through a composite distribution of field particles in direction D. Here the density of field matter is highest at the center at point (0, 0) on the axis grid (as shown as darker grays) and lower as one moves away from the center (as shown as lighter grays). As before, the shading between field particles (shown as triangles) and the interface particles (shown as squares) represent the distance between corresponding particles.

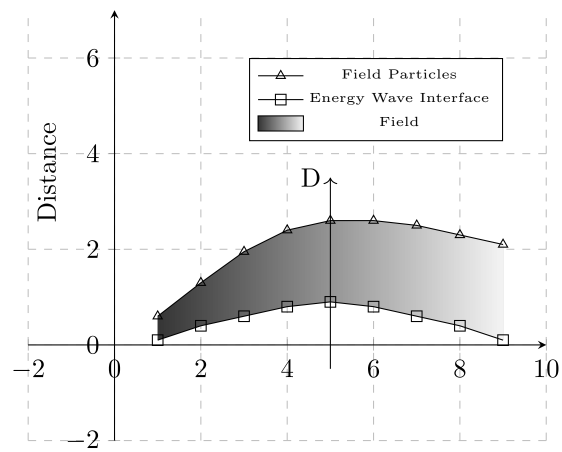


Figure 8: Composite Field Distribution

Given the unequal ability to transfer energy to new field rotations as we move laterally across the interface, the results for composite distributions differ from those of standard distribution in subsection 4.2. We can see in this figure that the right-side of the interface achieves similar results as subsection 4.2, that is, the resistance is flat and has a negligible affect the particle's path. Results are different on the left-side of the interface as field particles are closer to those of the corresponding interface particles[5]. Let's take a closer look at particles on the left-side of the interface.

[5] Please keep in mind that, while individual particles are plotted for each series of triangles or squares, actual particles are myriad and spread out across the respective plot-lines.

Consider the leftmost points in both the triangles and squares plotted lines. As particles of the interface (squares) interact with field particles (triangles), there is an increased likelihood that any such interface particle will gather up more than one field particle. This likely scenario carries for some distance along the interface to the right.

We now see an inequality of particles gathered up in the new, emerging energy rotation: There are more particles in the energy rotation on the left than on the right. However, besides a greater number of particles in rotation on the left-side, the decreased interface to field distance on the left has another, critical affect: The velocity of rotations on left-side are faster than those on the right-side.

The interface uses more energy to gather particles on the left-side and so causes an imbalance of energy across the interface. We now find that more field particles occupy the space on the left-side of the emerging energy rotation than in the middle or on the right-side. We have less overall energy on the left-side but the field particles are condensed into a greater density. This is similar to a 'canyon effect' and we find that the field particles on the left-side are rotating faster than in the middle or right-side.

In addition to the faster rotation velocity of field particles, we find that the rotating particles are 'toed' inwards. The overall effect is that the faster, toed-in rotation of field particles compels the energy wave to accelerate away from the direction (D) of travel towards the center of the massive object. In this way, energy wave/particles traveling in a composite distribution of field matter will see the direction of their travel shifted in the direction of the core of the composite object.

## 4.4 Energy Particle/Wave Velocity

In composite distributions sufficient velocity and momentum of energy particle/waves can counteract, or mitigate, the discussed effect of movement towards a massive object. Large amounts of momentum and velocity can flatten the interface's curved presentation to the field and minimize the movement towards the massive object. Though these factors can lessen the impact of particle interface motion, it does not eliminate the effect. For example:

- Even though traveling at light speed, photons of light still curve around a massive object such as our sun. This was in shown to be true during the solar eclipse of 1919. During the eclipse observations by two British expeditions (Eddington, Dyson, and Davidson) showed that certain stars whose actual positions were behind our sun actually showed them visible to the side of our sun due to their light getting curved around the sun. These results significantly advanced Albert Einstein's career as his equations predicted this effect.
- Also, note asteroid 2024 PT5. It was almost caught by Earth's gravity: Almost but not quite. Its momentum and velocity was just enough to keep it from colliding with the Earth. It ended up getting a gravity assist from our planet, leaving orbit, and charting a new course through our solar system.