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A fluid model of matter

Abstract

Specific properties of matter are described in terms of fluid dynamics.

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Initial conditions

We have a closed, continuous (simple) 4-D space. It is filled with fluid, ether.

At t_0, there is an explosion (the Big Bang). A 4-D hypersphere blast wave goes out. Eventually it settles into a layer of motion expanding out at c, the speed of sound.

Particle

Elements of the quiescent fluid ahead of the layer break through. From an energy standpoint, it is cheaper to not get excited than to get excited (Figure 1).

In the blast wave's frame of reference, these are sinks. The sink spawns a vortex.[i] So there it is: a particle (Figure 2).

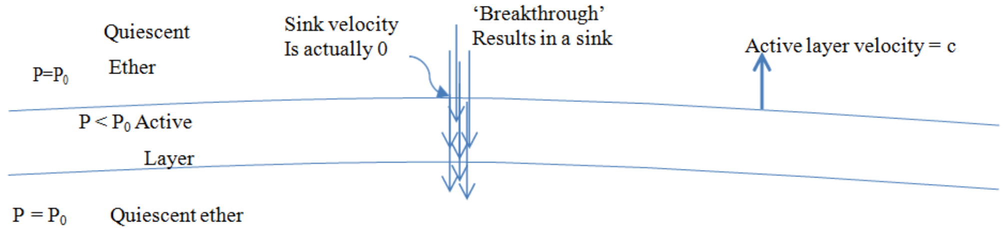

Figure 1 In the blast wave's frame of reference, these are sinks.

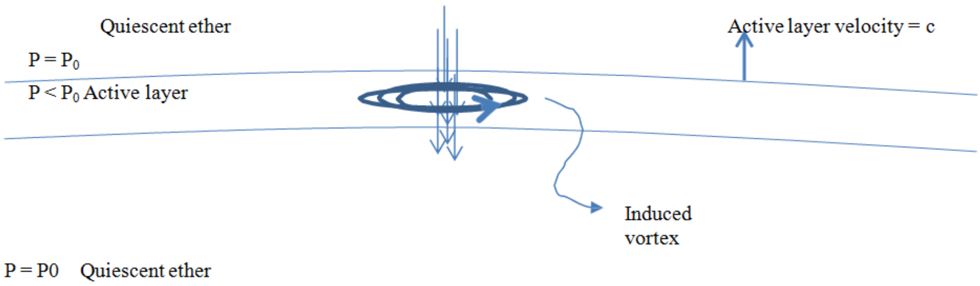

Figure 2 A particle.

We know from 3-D vortexes that identical vortexes repel. Since electric repulsion varies as $1/x^2$ the velocity field of the vortex is:

$$\left(u=\Gamma/r^2\right)^{ii}$$

Where u is fluid velocity and gamma is the vortex constant. Vortices of opposite rotational sense attract. They get fairly close and then they rotate about each other as with 3-D.

[i]The exact definition of 3-D vortex rotation is not discussed.
[ii]I have shown with a Maple-generated 4-D Navier-Stokes that this velocity field satisfies it.

Mass

The mass of the sink is the mass of the particle:

$$m_p=(4/3)\pi r_s^3 l\rho$$

Where m_p is mass of particle

r_s is radius of sink

l is length of sink in active layer

ρ is density of fluid

Particle acceleration

The far field flow a vortex feels from another vortex is like a linear velocity. So torque is:

$$T=(\omega_s \times v)d \times l$$

Where ω_s is the frequency of the vortex at the sink.

v is the fluid velocity due to the far vortex

d is the depth of penetration of that velocity

l is the length of the vortex

This is the torque on the sink. The reaction to that is

$$T=I_1\omega_1\omega_2$$

the reaction of a vortex to a torque.[iii]

This implies that only the boundary layer of a vortex flow field penetrates far field.

Velocity

Now let's look at the vortex-sink in motion. The vortex is at an angle (Figure 3):

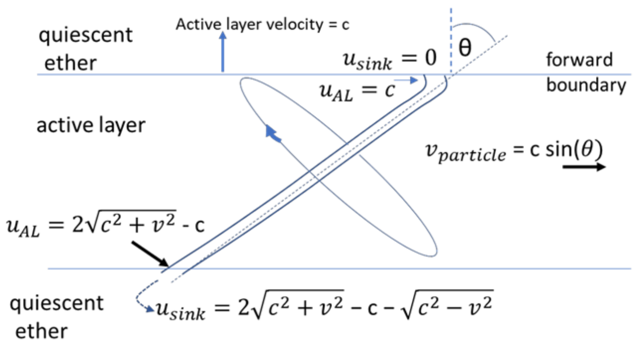

Figure 3 The sink enters orthogonally from the forward boundary space.

The sink enters orthogonally from the forward boundary space. The vortex has to bend it to the angle.

Further, the vortex has to constrict the sink to speed it up. The average velocity for the sink is $\sqrt{c^2+v^2}$ relative to the active layer. The sink velocity at exit is:

$$u_{AL}=2\sqrt{c^2+v^2}-c$$

The actual sink velocity at exit is:

$$u=u_{AL}-c\cos(\theta)=2\sqrt{c^2+v^2}-c-\sqrt{c^2-v^2}$$

Until it equals c, then it continues at c.

The result is

$$v=c\sin(\theta)$$

where v is particle velocity.

The sink enters the Active Layer orthogonal to the space of the Forward Boundary. Perhaps it is this near perpendicular part of the sink's vortex layer that generates the far field fluid velocity.

Mass change

The mass is governed by the size of the aperture in the forward boundary, the velocity of the sink, and the geometry of the sink. There is a slight increase in mass as the sink varies from straight. But length (velocity) does not affect the sink volume. The diameter decreases proportionally as the sink grows longer. This means the sink is accelerated by the vortex while in the active layer.

$$m \cong m_0$$

Transverse, longitudinal mass

Since $v = c\sin(\theta)$, $\cos(\theta)=\frac{\sqrt{c^2-v^2}}{c}=\frac{1}{\gamma}$ where γ is the relativistic multiplier.

The lab has shown 'transverse mass' and 'longitudinal mass' are:

$$Transverse\ mass=m_t=\gamma m_0$$

$$Longitudinal\ mass=m_l=\gamma^3 m_0$$

In this model, it is not force and acceleration; it is a change in angle and so torque. The response of a gyroscope to torque is

$$T = f \times r = I_1\omega_1\omega_2$$

Where T is torque, ω_1 is the rotational velocity of the vortex, ω_2 is the change in angle of the vortex per second and I_1 is the moment of inertia about the ω_1 axis.

The sink moment of inertial is the moment of inertial of a rod about one end

$$I = ml^2 / 3$$

Longitudinally, the moment of inertia transforms as:

$$I_l=\gamma^2 I_0$$

However, transversely, one takes the projection of l in the direction of torque, and this projection transforms in the direction of $\dot{v}$. So $l = \frac{l_0}{\cos\varphi}$.

$$I_t=\frac{I_0}{\cos^2\varphi}$$

Torque is f cross r, and in the particle velocity plane ($\dot{\theta}$) torque is:

$$T = fr\cos(\theta)$$

And $v = c\sin(\theta)$ so:

$$\dot{v} = c\cos(\theta)\dot{\theta}$$

So what the lab envisions as:

$$f = ma$$

Is actually

$$fr\cos(\theta) = I_s\omega_s\omega_2 = I_s\omega_s\dot{v}/c\cos(\theta)$$

[iii]Although this is the formula in the literature, I have issue with it. This says the angular velocity generated is independent of I_2. I submit ω_2 is created and hence $I_2\omega_2$ is also a change in angular momentum. Resulting in:

$$T=I_1\omega_1\omega_2+I_2\omega_2$$

There is a transformation of the force as the vortex tilts, since the accelerating field is at an angle:

$$f = f_0 \cos(\theta) = f_0/\gamma$$

However, this projects the force as orthogonal to r so the cross product angle goes away.

There is an increase in $r{:}\, l = \gamma l_0$ so longitudinally:

$$f_0 l_0 = \gamma^3 I_0\, \omega_s\, \dot{v}/c$$

In the transverse (φ) torque case the acceleration is in the $\dot{\varphi}$ plane so

$$\dot{v} = c\, \cos(\varphi)\dot{\varphi}$$

Transversely $l = \frac{l_0}{\cos\varphi}$, and $f = (f_0 \cos(\theta))\cos(\varphi)$ giving:

$$f_0 l_0 = \frac{\gamma}{\cos^3\varphi} I_0 \omega_s \dot{v} / c$$

with $\cos(\varphi)$ close to 1.

Electric, magnetic field

The electric field is vortex rotational velocity orthogonal to $\hat{\mathrm{R}}$. When the sink tilts; there is now some rotation with an $\hat{\mathrm{R}}$ component. This is the magnetic field.

Gravitational field

From fluid theory: if an object trails a vortex there is drag. The sink acquires rotational velocity in its course through the AL. So the particle experiences drag, which retards the Active Layer (AL) Forward Boundary, causing a dimple.

Electromagnetic radiation

Electromagnetic radiation is a Hill's Vortex, the width of the AL and traveling perpendicular to $\hat{R}$. So photons come in one size. The radiation frequency is the rotational frequency of the vortex.

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None.

Conflict of interest

The author declares that there is no conflict of interest.