



PPC LAW OF GRAVITY

(Pawan Upadhyay's Pressure-Curvature Law of Gravity)

Pressure Waves in the PPC Law of Gravity

Author: Pawan Upadhyay (*Independent Researcher, 2025*)

 pawanupadhyay28@hotmail.com

1. Introduction

In the framework of the **Pressure–Curvature Law of Gravity (PPC Law)**, gravity is interpreted as a manifestation of **pressure-induced curvature** within spacetime.

Mass not only bends spacetime through its energy density but also applies a **pressure field** upon it.

When this pressure varies dynamically, **Pressure Waves** arise – oscillations that propagate through the universal pressure field at the speed of light.

These waves are the physical expression of what General Relativity describes as gravitational waves.

Thus, *Pressure Waves* form the **dynamic extension** of the PPC Law of Gravity.

2. Theoretical Foundation

The PPC Law establishes that:

$$P_g = \rho c^2$$

The **pressure gradient** gives rise to a gravitational force:

$$\mathbf{F} = \nabla P_g$$

In Einstein's formulation:

$$G_{\mu\nu} = \frac{8\pi G}{c^4} T_{\mu\nu}$$

$$T_{\mu\nu} = \left(\rho + \frac{p}{c^2}\right) u_\mu u_\nu + p g_{\mu\nu}$$

In the weak-field limit:

$$\nabla^2 \Phi = 4\pi G(\rho + 3p/c^2)$$

3. Formation of Pressure Waves

If the pressure or density field varies with time:

$$p = p(x, t), \quad \rho = \rho(x, t)$$

These are described by the classical wave equation:

$$\frac{\partial^2 \Phi}{\partial t^2} = c^2 \nabla^2 \Phi$$

4. Flow of PPC Law

**Mass → Pressure → Force → Curvature →
Pressure Waves in Spacetime**

*Figure 1 – Propagation of Pressure Waves
according to the PPC Law*

*Pawan Upadhyay – Discoverer of the PPC Law
of Gravity (2025)*

5. Physical Interpretation

Pressure Waves are **vibrations of the spacetime pressure field** created by mass-energy variations.

They carry curvature energy through the universe and manifest as detectable gravitational waves.

Under this interpretation:

- Gravity arises from **pressure-induced curvature**.
- Gravitational waves are **pressure waves** in spacetime.
- The PPC Law unifies mass, pressure, and curvature in a single causal chain.

6. Summary

“Gravitational waves are pressure waves in spacetime – vibrations of the universal pressure field created by mass.”

– *Pawan Upadhyay, 2025*

7. References

1. Einstein, A. (1915). *The Field Equations of Gravitation. Sitzungsberichte der Preussischen Akademie der Wissenschaften.*
2. Abbott, B. P. et al. (LIGO Scientific Collaboration) (2016). *Observation of Gravitational Waves from a Binary Black Hole Merger. Physical Review Letters*, 116, 061102.
3. Upadhyay, P. (2025). *PPC Law of Gravity – Independent Discovery*. GitHub Repository: <https://github.com/pawanupadhyay2025/PPC-law-of-gravity->

✓ Paper Summary

This paper presents a new interpretation of gravitational waves as *Pressure Waves* – dynamic oscillations in spacetime's pressure field.

It extends Einstein's General Relativity by identifying pressure as the **physical mechanism** behind curvature formation, completing the causal sequence:

Mass → Pressure → Force → Curvature → Pressure Waves → Motion.
