The Direction Number in Absolutism: The Geometric Origin of Energy Dispersion

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Abstract

The Direction Number N is a core dimensionless parameter in Absolutism, representing the number of independent directions into which energy is uniformly dispersed in space. Starting from geometric intuition, combined with radiation pressure experiments and the mass-energy equivalence equation, this paper defines the direction number as $N = c/g$ (numerically equal in natural units). It clarifies its physical significance: a measure of energy dispersion, a criterion for spacetime dimensionality, and an indicator of the absolute direction of motion. This paper lays the foundation for deriving the minimum mass unit of matter.
Keywords: Absolutism; Direction Number; Radiation Pressure Experiment; Energy Dispersion; Natural Units

1 Introduction

In the framework of Absolutism, the speed of light c is an intrinsic constant of absolute space, and the gravitational acceleration g determines the local energy concentration. We introduce a dimensionless parameter — the Direction Number N, which directly characterizes the number of independent directions in which energy is dispersed in space. This concept originates from the most naive geometric intuition: an atomic bomb explodes and radiates energy in all directions, while a radiation pressure experiment involves only one direction. Starting from this intuition, this paper strictly defines the direction number and discusses its physical significance.

2 Geometric Intuition of the Direction Number

Consider a point source radiating energy uniformly onto a spherical surface. Each tiny surface element on the sphere represents an independent direction. Let the total energy be E_{total}, which is dispersed into N directions. Then the energy carried by each single direction is:

$$E_{\text{single}} = \frac{E_{\text{total}}}{N}.$$

Here, N is the Direction Number, a purely geometric quantity without dimensions.

In isotropic radiation scenarios such as atomic bomb explosions, N is extremely large (tending to infinity), indicating uniform energy dispersion. In a radiation pressure experiment, a collimated light beam has only one direction, so $N = 1$. Therefore, the value of N ranges from 1 (completely concentrated) to infinity (completely dispersed), reflecting the degree of energy concentration.

3 Derivation of $N = c/g$ from Radiation Pressure and Mass-Energy Equivalence

3.1 Radiation Pressure Experiment

A beam of light irradiates perpendicularly onto a perfectly absorbing scale. The optical power is P, and the radiation pressure force is $F = P/c$. The mass reading M of the scale satisfies $F = Mg$, thus:

$$M = \frac{P}{gc}.$$

Within a light pulse duration Δt, the light energy is $E = P\Delta t$. Define the vector mass of light as $m_{\text{vec}} = E/c^2$. Substituting gives:

$$M = \frac{c\Delta t}{g} m_{\text{vec}}. \tag{1}$$

3.2 Numerical Relationship with the Mass-Energy Equation

When the light pulse duration is set to $\Delta t = c/g$, Equation (1) simplifies to $M = m_{\text{vec}}$. The choice $\Delta t = c/g$ corresponds to the time it takes for light to decelerate from c to zero under gravitational acceleration g. In Absolutism, this is the characteristic time for light to solidify into mass. At this point, the single-direction light energy is:

$$E_{\text{single}} = P\Delta t = (Mgc) \cdot \frac{c}{g} = Mc^2 = m_{\text{vec}}c^2.$$

Consider an isotropic radiation source with total energy $E_{\text{total}} = mc^2$. It should contain N independent directions, each with energy E_{single}. If this source has the same total energy as the light source in the radiation pressure experiment, then $E_{\text{single}} = E_{\text{total}}/N$. Substituting $E_{\text{single}} = m_{\text{vec}}c^2$ and $E_{\text{total}} = mc^2$, we obtain:

$$\frac{mc^2}{N} = m_{\text{vec}}c^2 \quad \Rightarrow \quad N = \frac{m}{m_{\text{vec}}}.$$

3.3 Equality in Natural Units

[1] In natural units, we set $c = 1$. In this case, $\Delta t = 1/g$ and $M = m_{\text{vec}}$. For an isotropic radiation source, the geometric direction number N is the number of surface elements into which the sphere is divided. This value is exactly equal to $1/g$, so the direction number is:

$$N = \frac{1}{g} \quad \text{(in natural units)}.$$

When restoring SI units, the numerical value of N equals c/g, but N itself remains dimensionless; the relation $N = c/g$ is only a numerical coincidence in SI. Thus, the numerical value of the Direction Number N is equal to the ratio of the speed of light to the local gravitational acceleration, but its essence is the geometric number of dispersion directions, which is dimensionless.

4 Physical Significance of the Direction Number

1. **Degree of Energy Dispersion**: At the Earth's surface, $g \approx 9.8\,\text{m/s}^2$, so $N \approx 3 \times 10^7$, meaning energy is dispersed into approximately 30 million directions. At the black hole horizon, $g = c$, so $N = 1$, meaning energy is completely concentrated.

2. **Criterion for Spacetime Dimensionality**: $N = 1$ corresponds to 1D space; $N = 2, 3$ corresponds to 2D space; $N \geq 4$ corresponds to 3D space.

3. **Indicator of Absolute Direction of Motion**: The unique direction corresponding to $N = 1$ is the direction of the Universe Shell's motion in absolute space (Hydra constellation, velocity $\approx 620\,\text{km/s}$).

4. **Directionality of Mass**: Scalar mass (rest mass) corresponds to the limit $N \to \infty$, while vector mass corresponds to finite N.

5 Conclusion

The Direction Number $N = c/g$ is a fundamental parameter in Absolutism. It concisely unifies the speed of light, gravity, geometric directions, and spacetime structure. In a follow-up paper, we will show that at $g = c$ (i.e., $N = 1$), light transitions from rectilinear to circular motion, leading to the formation of a minimum mass unit $m = 4G/c^3$ and radius $r = 2G/c^2$.

[1] Natural units set $c = \hbar = G = 1$. In this paper, only $c = 1$ is used; $\hbar$ and G are not involved.

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