Overview of Publications on Time-Mass Duality
A Theoretical Framework for Extending Modern Physics

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Abstract

This overview presents a collection of works developing a new theoretical framework to extend physics: the Time-Mass Duality. This approach proposes a rethinking of time and mass, offering solutions to unresolved questions in quantum mechanics, quantum field theory, and cosmology—such as nonlocality or dark energy. The documents form a program spanning foundational ideas, mathematical models, and practical applications.

1 Introduction

The following publications develop the Time-Mass Duality, a novel perspective on time and mass with far-reaching implications for physics. They are organized into five sections: starting point, conceptual foundations, mathematical formalization, applications, and frontier questions. All files are available in the repository at https://github.com/jpascher/T0-Time-Mass-Duality/tree/main/2/.

2 Starting Point: Field Theory as the Initial Idea

2.1 Field Theory and Quantum Correlations

(348.297 Bytes, 31.03.2025)

This document marks the starting point. It questions why particles seem instantly connected over large distances (nonlocality) and proposes a new field structure as an answer, later leading to the Time-Mass Duality.

3 Conceptual Foundations and Motivation

3.1 The Necessity of Extending Standard Quantum Mechanics and Quantum Field Theory

(257.169 Bytes, 31.03.2025)

It highlights weaknesses in conventional theories, e.g., linking quantum mechanics and gravity, and introduces Time-Mass Duality as a solution.

3.2 Summary - Complementary Dualism in Physics - From Wave-Particle to Time-Mass Concept

(145.857 Bytes, 31.03.2025)

This document simply explains Time-Mass Duality: just as light is both wave and particle, time and mass might be two sides of the same coin.

3.3 A New Perspective on Time and Space: Johann Pascher's Revolutionary Ideas

(235.024 Bytes, 31.03.2025)

Accessible to all, even without math: It introduces the T0 model, where time is fixed and mass varies—unlike Einstein's view. It explains puzzles like instant particle connections or the universe's expansion in a simple way.

4 Mathematical Formalization

4.1 Essential Mathematical Formalisms of Time-Mass Duality Theory with Lagrange Densities

(349.877 Bytes, 31.03.2025)

Here begins the precise development. Using simple rules (setting everything to 1), the theory is mathematically described, e.g., with the Lagrange method.

4.2 Mathematical Formulations of Time-Mass Duality Theory with Lagrange

(544.118 Bytes, 31.03.2025)

It deepens the models for particles like the Higgs field, showing how the theory works mathematically.

4.3 Mathematical Formulation of the Higgs Mechanism in Time-Mass Duality

(316.917 Bytes, 31.03.2025)

This document explains how the Higgs mechanism (which gives particles mass) fits into the new theory.

5 Applications and Extensions

5.1 Dynamic Mass of Photons and Its Implications for Nonlocality

(265.909 Bytes, 31.03.2025)

It explores whether light (photons) has variable mass and how this explains particle connections.

5.2 A Mathematical Analysis of Energy Dynamics

(377.701 Bytes, 31.03.2025)

This document applies the theory to the universe, viewing dark energy as distributing energy, not causing expansion.

6 Cosmological and Frontier Areas

6.1 Beyond the Planck Scale

(347.870 Bytes, 31.03.2025)

It asks how the theory might address the smallest (Planck scale) and biggest questions in physics—like black holes or the early universe.

7 Additional Relevant Documents

7.1 Mass Variation in Galaxies

(347.376 Bytes, 31.03.2025)

It shows how variable mass affects galaxies, explaining star movements without dark matter.

7.2 Unification of the T0 Model: Foundations - Dark Energy and Galaxy Dynamics

(351.434 Bytes, 31.03.2025)

A comprehensive work applying the theory to cosmology and galaxies.

7.3 Natural Units with Fine-Structure Constant alpha = 1

(336.496 Bytes, 31.03.2025)

It proposes a simple system where a key number (fine-structure constant) is set to 1 to simplify physics.

8 German Versions

Additionally, German versions are available:

- Die Notwendigkeit einer Erweiterung der Standard-Quantenmechanik und Quantenfeldtheorie (276.670 Bytes)
- Dynamische Masse von Photonen und ihre Implikationen für Nichtlokalität (276.670 Bytes)
- Eine mathematische Analyse der Energiedynamik (388.573 Bytes)
- Eine neue Perspektive auf Zeit und Raum (242.204 Bytes)
- Feldtheorie und Quantenkorrelationen (356.638 Bytes)
- Jenseits der Planck-Skala (351.328 Bytes)
- Kurzgefasst - Komplementärer Dualismus in der Physik (149.923 Bytes)
- Massenvariation in Galaxien (362.547 Bytes)
- Mathematische Formulierung des Higgs-Mechanismus (325.463 Bytes)
- Mathematische Formulierungen der Zeit-Masse-Dualitätstheorie mit Lagrange (559.012 Bytes)

9 Summary and Outlook

These works form a program rethinking physics. Time-Mass Duality uses simple rules to address big questions like nonlocality or dark energy. Future steps could include testing the theory, refining models, and simulations to create a unified physics.