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CHAOTIC DYNAMICS OF AN ELECTRON

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This paper develops a geometric and dynamic model of the electron by constructing a toroidal image on a two-layer sphere. We demonstrate that the isometries of this toroidal image generate the unitary group. Additionally, we explore the modular group action on the sphere, revealing that minimal equivalence classes are determined by prime numbers. By studying pendulum oscillations, we present a new representation of the Riemann zeta function and discuss the emergence of complex probability amplitudes in chaotic dynamics, which align with the generalized Schrödinger equation.

MSC: 20C35, 60J65, 70-10, 81-10
Keywords: Brownian walk, mathematical pendulum, modular group, Riemann zeta function, Schrödinger equation

Contents

1. Introduction

There are two main directions of electron modeling in physics. On the one hand, this is a set of toroidal ring models, which were initiated by Parson [5], and, on the other hand, this is the standard model of electroweak interactions, which originates from the work of Yang and Mills [9], then was continued by Glashow [3]

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