

Timur Kamalov

Title: Physics of Zitterbewegung Reference Frames

Moscow Institute of Physics and Technology

Dolgoprudny, Moscow Region, Russian Federation

Abstract:

Physics today, both Classical and Quantum, requires a notion of inertial reference frames. However, how to find a physical inertial frame in reality where there always exist random weak forces? In this paper a modified Zitterbewegung description of the behavior of an electron is used, which differs from the Schrodinger description in that instead of tremble an electron, the tremble of the reference frame is considered, and such a reference frame is called the Zitterbewegung Reference Frame or abbreviated ZB Reference Frame. We suggest a description of the motion in Zitterbewegung Reference Frames by means of inclusion of higher time derivatives. They may play a role of non-local hidden variables in a more general description can be named Zitterbewegung (ZB) Mechanics complementing both classical and quantum mechanics.

PACS: 03.65.Ud, 05.45.Mt