

THE FEATURES OF THE SPACETIME

VIOREL LAURENTIU CARTAS

MIAA Department, Faculty of Engineering and Agronomy of Braila, “Dunarea de Jos” University of Galati, 47 Domneasca Str., 800008 Galati, Romania

Abstract. The present paper aims to introduce a new algebra based on the knots and their ability to change dramatically the physical state, when we act on them with the braiding operator. The frame of all this ideas is the topological quantum computing. Nowadays, the quest for a reliable quantum computer technology refers, among others quantum phenomena, to the Quantum Hall Effect. Setting suitable quantum experiments (for instance a super lattice - two dimensional electron system that appears in the hetero structures of two semiconductors) involving exceptionally strong magnetic fields and very low temperatures, the QHE puts into evidence new quasi particles, evolving in 2+1 dimensions space. Such a topological quantum computer will successfully fight against the undesirable interaction between the quantum system and the environment (de-coherence). The knotted quantum world-lines of quasi-particles (anyons) provide the quantum computing physical support. The necessary algebra (which will deal with) is the algebra of the creation and annihilation of the knot’s braids when the corresponding braiding operators act.

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1. Introduction

In extreme physical condition (a large magnetic field and a very low temperature) some special materials behave peculiar. The quantum Hall effect does appear in such special systems. New physical objects emerge: anyons. In the sense of the number of particles allowed to occupy certain quantum levels, they are nor