Some applications of the geometry of high-dimensional space-time in physics

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It is an old idea from A. Einstein and H. Poincare to consider the time as 3-dimensional, and it is also actual at the present time. The space should be separated: 3D space related to the translations and 3D space related to the rotations. Indeed, the existence of our observable space is not sufficient for existence of rotations. This 6D space is indeed at the same time a Lie group which is isomorphic to the group Spin(4), and can be approximated by the group of translations and rotations in 3-dimensional Euclidean space. The 3D time in order to preserve the Lorentz transformations is necessary to contain an addend of type $(\mathbf{v} \times \mathbf{r})/c^2$. This component gives possibility that this model of 3D time can be applied to the theory of atoms, and to give precise geometrical description of the electronic structure and the nucleus, and also to give description to the dark matter/ether. More geometrical applications can be done through the so called motions without inertia. Indeed, if a rotation is constrained, then it converts into translation as non-inertial motion. Conversely, if the translation is constrained, then it converts into rotation. If both translation and rotation are constrained if some conditions are satisfied, then the body will be time displayed. A step further, the basic four interactions (strong and weak nuclear forces, electromagnetic and gravitational forces) can be described as a consequence of the non-commutativity among the translations and rotations in corresponding Lie groups. An experimental verification can be found in case of the g-factors of the elementary particles electron and muon. The electron appears to be a circle with radius 1.41 fm and which rotates with velocity about $\alpha c/2$, $(\alpha = 137.036^{-1})$, and also has orbital velocity with the same velocity when it is not in orbit of an atom. In case of electron this model predicts the g-factor, which is index of the ratio of the electron's magnetic momentum to its spin angular momentum, is equal to $g_e = -2.00231930436224$, while the experimental value is $-2.00231930436170 \pm 152$. Analogous results are obtained by the Quantum Electrodynamics, but they are used for precise determination of the constant α. Moreover, in case of muon, this model predicts $g_m = -2.002331839358573$. The recent last experiment in Fermilab (2021) has found that $g_m = -2.0023318408 \pm 11$, while the Quantum Electrodynamics predicts $g_m = -2.00233183620(86)$, which is 3 SD less than the experimental value.