Complex sphere in Ya.A. Smorodinsky' works and in algebrodynamics

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In the "algebrodynamics" (Kassandrov, 1992 etc.) one claims to relate the space-time geometry with properties of exceptional quaternion-like algebras, and particle-field dynamics – with "hyper-analytical" functions over such algebras and their singularities respectively. On a (3+1) subspace of the biquaternionic algebra **B** a Lorentz invariant nonlinear field theory based on the *B*-generalized Cauchy-Riemann equations has been developed previously; see, e.g., the review (Kassandrov, 2007).

The $SO(3, \mathbf{C})$ group of automorphisms of **B**-algebra is 2:1 isomorphic to the proper Lorentz group. Numerous properties and parametrizations of correspondent complex 2-sphere has been revealed, in particular, by Ya.A. Smorodinsky and M. Huszar (1970; 1972) and used to derive matrix elements and spherical functions for unitary representations of Lorentz group.

Similarly, we contruct an explicit mapping of the $3\mathbf{C}$ space into the causal sector of Minkowski space (Kassandrov, 2005a). In the procedure, the additional phase-like invariant of Lorentz transformations arises which may be responsible for geometric explanation of the wave properties of particles and of quantum interference phenomena in particular.

From dynamical viewpoint, introduction of the primordial complex space makes it possible to realize the Feynman-Wheeler's hypothesis about "all the electrons as one and the same electron" (in its different locations on the sole World line). This follows from the fact that in complex space (contrary to the real Minkowski one!) the "retardation equation" has arbitrary many roots that correspond to the ensemble of identical particles – "dublicons" (Kassandrov, 2005b).

Finally, we are going to discuss the concept of "complex random time" that unavoidably arises in the framework of **B**-algebrodynamics and naturally leads to the irreversibility of physical time and to universal global correlations in casual processes discovered by S.E. Schnoll (1998 etc.). We mention that the concept of multidimensional time has been presented by A.D. Sakharov (1984) and is revived nowadays in relativity, quantum mechanics and superstring theory.

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