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Dirac Calculus and Schwartz Linear Algebra.

It was in 1930 that Paul Dirac published his *Principles of Quantum Mechanics*, in this famous treatise Dirac introduced several “manipulation rules” for vectors and operators in a linear space, which, in their complex, constitute the so called “Dirac Calculus”. The operation of continuous-superposition is the right tool which allows us to build - in a mathematically rigorous way - the extended Linear Algebra of Dirac in the spaces of distributions, via their natural topological-linear structures. More precisely, the goal we reach is in the following direction: we shall see that the natural algebraic-topological structure of those spaces allows us to define a generalization of the finite linear combinations, when the sets indexing the families of vectors are continuous sets, even in the case in which the systems of coefficients has a continuous-infinity of terms different from zero. Moreover, besides the reconstruction of the Dirac Calculus, we reread some classic theorems of Functional Analysis, in terms of the new extended linear algebra and we provide a new interpretation of several classic deep concepts of Linear Functional Analysis extremely feasible for applications to Physics, Engineering, Economics and Finance. (Received August 28, 2015)