1046-46-437 **Woodford W. Zachary*** (wwzachary@earthlink.net), Department of Electrical and Computer Eng., Howard University, Washington, DC 20059, and **Tepper L. Gill** (tgill@access4less.net), Department of Electrical and Computer Eng., Howard University, Washington, DC 20059.

*Constructive Representation of the Feynman Operator Calculus in Banach Spaces.*

A new class of separable Banach spaces is first constructed which contain the Henstock-Kurzweil and Denjoy-Perron integrable functions as well as the class of finitely additive set functions (in particular, the Feynman kernel and the Dirac measure) as norm bounded elements. Then infinite tensor product Banach spaces are constructed along the lines used by von Neumann to construct infinite tensor product Hilbert spaces. These spaces are used to extend our earlier constructive representation theory for the Feynman operator calculus in Hilbert spaces to the Banach space setting. It is then shown that the usual theory of semigroups on Banach spaces can be extended to the time-ordered setting. This means that the formulation of physical theories using our approach is a natural extension of basic operator theory to the time-ordered setting. It also means that the problematic disentanglement method used by Feynman to justify his theory by relating it to standard methods is not required when our approach is used. Finally,the Feynman path integral is extended to a very general setting and a generalized Feynman-Kac theorem is discussed which is applicable to parabolic, hyperbolic and Schroedinger equations. (Received September 02, 2008)