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*Disentanglement in the Construction Formulation of the Feynman Operator calculus.*

I discuss some recent progress on the Feynman operator calculus [F]. The theory is constructive in that operators acting at different times commute. The theory extends the important theorems of semigroup theory, including the Hille-Yosida theorem to the time-ordered setting (see also Gill and Zachary [GZ]). A major objective in [GZ] was to prove two open conjectures of Dyson for QED; namely that, in general, we can only expect the perturbation expansion to be asymptotic, and that the ultraviolet divergence is caused by a violation of the Heisenberg uncertainty relation at each point in time. Although we do not advocate the disentanglement process, we have recently been convinced it can be useful in cases where the full operator calculus is neither necessary nor required. In this talk I also show that our theory provides a natural framework for the disentanglement process.

[F] R. P. Feynman, *An operator calculus having applications in quantum electrodynamics*, Phys. Rev. **84** (1951), 108-128.

[GZ] T. L. Gill and W. W. Zachary, *Foundations for relativistic quantum theory I: Feynman's operator calculus and the Dyson conjectures*, J. Math. Phys. **43** (2002) 69-93. (Received September 14, 2007)