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On a Modern Variation of the Classic Results of Shale-Stinespring and Ruijsenaar on External Field QED

The classic results of Shale-Stinespring and Ruijsenaar together assert that an implementation of the time evolution of external field quantum electrodynamics between constant time hyperplanes on standard Fock space is possible if and only if the vector part of the external potential is zero. A modern approach by Deckert et al. to this problem achieves an implementation of time evolution for arbitrary external potentials by varying Fock spaces with time.

The residual freedom of this approach is discussed and classified. Furthermore, an attempt is made towards quantifying the speed of convergence of the relevant series.