Super-Adiabatic Particle Number in Schwinger and de Sitter Particle Production[1] ROBERT DABROWSKI, GERALD DUNNE, University of Connecticut — We consider the time evolution of the adiabatic particle number in both time-dependent electric fields and in de Sitter spaces, and define a super-adiabatic particle number in which the (divergent) adiabatic expansion is truncated at optimal order. In this super-adiabatic basis, the particle number evolves smoothly in time, according to Berry's universal adiabatic smoothing of the Stokes phenomenon. This super-adiabatic basis also illustrates clearly the quantum interference effects associated with particle production, in particular for sequences of time-dependent electric field pulses, and in eternal de Sitter space where there is constructive interference in even dimensions, and destructive interference in odd dimensions.

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