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 superadiabatic particle number in which the (divergent) adiabatic expansion is truncated at optimal order. In this superadiabatic basis, the particle number evolves smoothly in time, according to Berry's universal adiabatic smoothing of the Stokes phenomenon. This superadiabatic 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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