

# Adiabatic theorems for general linear operators and well-posedness of linear evolution equations

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In the first part of the talk, which is concerned with the well-posedness of linear evolution equations, I will present, among other things, simple new counterexamples to well-posedness. I will also present a well-posedness theorem – furnished with mild stability and regularity conditions – for linear operators  $A(t) : D(A(t)) \subset X \rightarrow X$  whose (first or higher) commutators are complex scalars. Applications include Segal field operators and Schrödinger operators for time-dependent electric fields. In the second part of the talk, which is concerned with adiabatic theory, I will present some new adiabatic theorems – with and without spectral gap condition – for general linear operators  $A(t) : D(A(t)) \subset X \rightarrow X$ . In parts, these theorems are motivated by open quantum systems which have attracted a lot of research in recent years. I will discuss applications both to closed quantum systems (described by skew self-adjoint operators  $A(t)$ ) and to open quantum systems (described by more general dissipative operators  $A(t)$ ).