

Eternal Adiabaticity and Long-Term Stability of Perturbed Quantum Symmetries

Kazuya Yuasa
Waseda University, Tokyo

We recently proved a KAM-like theorem for finite-dimensional quantum systems, showing that for any finite-dimensional quantum systems the conserved quantities can be characterized by their robustness to small perturbations. For fragile symmetries, small perturbations can lead to large deviations over long times, while for robust symmetries, their expectation values remain close to their initial values for all times. The long-term stability of the robust symmetries is based on the "eternal" adiabaticity of perturbed evolutions of finite-dimensional quantum systems. In this talk, I give an overview of this result, to stimulate discussions on possible generalizations to infinite-dimensional systems.