

## Abstract

It is well-known that dynamics are localized to strictly linear light cones in spacetime in classical and relativistic field theory, while non-relativistic quantum dynamics lack this feature. The Radin-Simon bound recovers a sense of ballistic upper bound for particle transport in few-body quantum dynamics, but fails to generalize as the number of particles tends to infinity. In recent years, we have developed a novel technique, based on monotonicity estimates for certain time-dependent observables, for proving ballistic upper bounds for general quantum many-body systems. In this talk, we present our recent results on various propagation constraints for the dynamical spreading of particle transport and quantum information in strongly interacting particle systems. Based on joint works with I. M. Sigal, M. Lemm, J. Faupin, and others.