This talk concerns the Strichartz estimates for orthonormal families of initial data which generalize the classical Strichartz estimates. These estimates have their motivation in understanding a system of infinitely many equations describing infinitely many particles. We prove new estimates in the case of the wave, Klein--Gordon and fractional Schrödinger equations.

Due to a certain technical barrier, except for the classical Schrödinger equation, the Strichartz estimates for orthonormal families of initial data have not previously been established up to the sharp summability exponents in the full range of admissible pairs. We obtain the optimal estimates in various notable cases and improve the previous results. The main novelty is the use of estimates for weighted oscillatory integral which we believe to be of wider independent interest. This talk is based on joint work with Neal Bez and Shohei Nakamura.