

Theme 2: dispersive

Invariant Gibbs dynamics for fractional wave equations in negative Sobolev spaces

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In this talk, we consider a fractional nonlinear wave equation with a general power-type nonlinearity (FNLW) on the two-dimensional torus. Our main goal is to construct invariant global-in-time Gibbs dynamics for FNLW. We first construct the Gibbs measure associated with this equation. By introducing a suitable renormalisation, we then prove almost sure local well-posedness with respect to Gibbsian initial data. Finally, we extend solutions globally in time by applying Bourgain's invariant measure argument.

We also consider the case of initial data consisting of the randomisation of a given pair of functions of negative regularities. We show that, in this case, probabilistic well-posedness fails unless we impose that the given pair has additional Fourier-Lebesgue regularity.