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Chenmin Sun, Nikolay Tzvetkov and Weijun Xu* (weijunxu@bicmr.pku.edu.cn), Peking University, 5 Yi He Yuan, Beijing, Beijing 100871, Peoples Rep of China. *Higher order nonlinear approximations to 2D cubic fractional wave equation and its Gibbs measure.*

We consider a class of higher order nonlinear approximations to both the 2D cubic fractional wave equation with random initial data and its associated Gibbs measure. These considerations are motivated from the weak universality questions in the weakly nonlinear regime in singular parabolic stochastic PDEs. Similar to the parabolic case, the coupling constant of the limiting equation and the Gibbs measure depend on the cutoff function in the approximation. Another interesting feature is that a strict positivity condition of the approximating potential is needed in order for the Gibbs measures to converge. This condition (for the approximation nonlinearity) is stronger than that for the global convergence for the corresponding wave dynamics, and we also show that it is almost necessary. Joint work with Chenmin Sun and Nikolay Tzvetkov. (Received September 14, 2020)