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**Sebastian Herr** and **Jeremy L Marzuola\*** ([marzuola@math.unc.edu](mailto:marzuola@math.unc.edu)), Department of Mathematics, CB#3250, Chapel Hill, NC 27599. *On discrete rarefaction in an NLS model for weak turbulence.*

With Jim Colliander, Tadahiro Oh and Gideon Simpson, we explored numerically and analytically some solutions that arise from a dynamical systems model introduced by Colliander-Keel-Staffilani-Takaoka-Tao (2010) to study the interaction of resonant frequencies in the cubic, defocusing NLS equation on the torus. This dynamical system gives a rich class of solutions, some of which we can prove exist, some of which we study probabilistically and some of which we show exist in approximate models, including a discrete Burger's equation. The goal is to present solutions that have cascades towards large frequency. We will discuss how the toy model fits into the study of the NLS equation and what information can be gained towards the idea of "weak turbulence." We will also discuss some of the perturbative techniques developed with Sebastian Herr towards reconciling the toy model with in particular the Burger's equation model. (Received January 14, 2014)