2013 PARTICIPATING SCHOOL
GLOBAL THEORY OF NONLINEAR DISPERSIVE EQUATIONS
TOPICS OF PRESENTATION

If you have any question, or comment to topics and their directions, please contact organisers. Directions in the following are just suggestions. If you prefer otherwise, please do as you wish. In principle, we want to see the gist of work in as a simple setting as possible. Thus, you do not have to discuss a full paper.

(1) Colliander, J., Keel, M., Staffilani, G., Takaoka, H., and Tao, T., *Sharp global well-posedness for KdV and modified KdV on* $\mathbb{R}$ *and* $\mathbb{T}$, J. Amer. Math. Soc, 16(3), 705-749.

Direction: Focus on the correction term reduction of modified energy. Present only result for KdV on $\mathbb{R}$.

(2) Colliander, J., Tzirakis, N., and Grillakis, M. G., *Tensor products and correlation estimates with applications to nonlinear Schrdinger equations*, Communications on pure and applied mathematics, 62(7), 920-968.

Direction: Focus on the correlation estimates, Section 3.

(3) Bourgain, J., *Approximation of solutions of the cubic nonlinear Schrdinger equations by finite-dimensional equations and nonsqueezing properties*, International Mathematics Research Notices, 1994(2), 79-90.

Direction: This paper is short. Present most parts in detail. At the beginning, explain nonsqeezing theorem in finite dimensional hamiltonian flow.

(4) Bourgain, J., *Periodic nonlinear Schrdinger equation and invariant measures*, Communications in Mathematical Physics, 166(1), 1-26.

(5) Germain, P., Masmoudi, N., and Shatah, J., *Global solutions for 3D quadratic Schrdinger equations*, International Mathematics Research Notices, 2009(3), 414-432.

Direction: Explain the notion of space-time resonance before getting into the detail. You may refer their survey articles to get some idea.

(6) Weinstein, M. I., *Lyapunov stability of ground states of nonlinear dispersive evolution equations*, Communications on Pure and Applied Mathematics, 39(1), 51-67.

Direction: Present all stuff in detail for nonlinear Schrödinger equation. You may omit discussion for general nonlinearity and gKdV. (If you prefer, you can present for a fixed $p = 3$, *for simplicity.*

(7) Burq, N., Grard, P., and Tzetkov, N., *Two singular dynamics of the nonlinear Schrdinger equation on a plane domain*, Geometric And Functional Analysis, 13(1), 1-19.

Direction: The paper contains two independent results. If you think time is too short, then you may choose one result to discuss. You may assume properties of Bessel functions.

(8) Colliander, J., Keel, M., Staffilani, G., Takaoka, H., and Tao, T., *Transfer of energy to high frequencies in the cubic defocusing nonlinear Schrdinger equation*, Inventiones mathematicae, 181(1), 39-113.

Direction: Present mainly Sec 1,2,4, that are reduction to toy model and the construction of resonant family. But for Section 3, sketch the argument without detailed proof.

(9) Babin, A. V., Ilyin, A. A., and Titi, E. S., *On the regularization mechanism for the periodic Kortewegde Vries equation*, Communications on Pure and Applied Mathematics, 64(5), 591-648.

Direction: Focus on Section 3, 6, and appendix to derive a priori bound. You may omit Section 4,5. Also, may refer Kwon-Oh, On unconditional well-posedness of modified KdV equation*, International Mathematical Research Notice, 2012(2012), 26 pages.*

(10) Keel, M., and Tao, T., *Endpoint strichartz estimates*, American Journal of Mathematics, 955-980.

Direction: You may assume that audience are familiar with the non-endpoint Strichartz estimate. Focus on Section 4–6.