

Exponential stability for the nonlinear Schrödinger equation with locally distributed damping

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This talk is concerned with the defocusing nonlinear Schrödinger equation with a locally distributed damping on a smooth bounded domain. We first construct approximate solutions for this model by using the theory of monotone operators. We show that these approximate solutions decay exponentially fast in the L^2 -sense by using the multiplier technique and a unique continuation property. Then, we prove the global existence as well as the L^2 -decay of solutions for the original model by passing to the limit and using a weak lower semicontinuity argument, respectively. Finally, we implement a precise and efficient algorithm for studying the exponential decay established in the first part of the paper numerically. Our simulations illustrate the efficacy of the proposed control design.