

Growth of Sobolev norms for Schrödinger equations on a class of compact manifolds

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In the last decades, a great effort has been made into understanding the long time dynamics of Schrödinger type equations on compact manifolds. In particular, as an indicator of energy transfer from higher to lower scales of motion, growth in time of Sobolev norms of the solutions has been largely investigated. In this talk I will present some results concerning upper bounds on the growth of Sobolev norms at any time. I will start from the case of linear Schrödinger operators on tori in arbitrary dimension and then present extensions to more general manifolds, such as spheres, compact manifolds with integrable geodesic flow, and Lie groups. Key points in order to obtain such results are suitable separation properties of the eigenvalues of the Laplacian operator, and the globally integrable structure of the classical underlying system. Finally, I will briefly discuss some applications to almost global existence results for a class of nonlinear Schrödinger equations.