

NONLINEAR SCHRÖDINGER EQUATIONS ON COMPACT MANIFOLDS

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Nonlinear Schrödinger equations have been studied by mathematicians for about thirty years. However, most of the contributions concern the equation on the whole Euclidean space, with the notable exception of J. Bourgain's contributions on tori. In the case of general Riemannian manifolds, the interaction of geometry with nonlinear operations leads to new phenomena, particularly if the manifold is compact. I shall review the state of the art concerning the Cauchy problem on such manifolds, and I shall describe optimal results on spheres, where new estimates on spherical harmonics play a crucial role.