



# The NLS ground states on product spaces

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We study the nature of the Nonlinear Schrödinger equation ground states on the product spaces  $\mathbb{R}^n \times M^k$ , where  $M^k$  is a compact Riemannian manifold. We prove that for small  $L^2$  masses the ground states coincide with the corresponding  $\mathbb{R}^n$  ground states. We also prove that above a critical mass the ground states have nontrivial  $M^k$  dependence. Finally, we address the Cauchy problem issue which transform the variational analysis to dynamical stability results.

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