Minimal support results for Schrödinger equations.

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ABSTRACT:

We consider a number of linear and nonlinear elliptic boundary value problems related to Schrödinger's equation. We use variants of the Sobolev embedding theorem, including the Moser-Trudinger inequality and the Hardy-Sobolev inequality, to derive necessary conditions for the existence of nontrivial solutions. These conditions usually involve a lower bound for a product of the norm of a variable coefficient V in the equation, often called the potential, the measure of the support of the solution, and a sharp Sobolev constant. In most cases, the bound is sharp, with the same extremals as the associated Sobolev inequalities.