

# Normalized solutions of Schrödinger equations on domains

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**Abstract:** The existence of solutions  $(\lambda, u) \in \mathbb{R} \times H_0^1(\Omega)$  of nonlinear Schrödinger equations like

$$(1) \quad -\Delta u + V(x)u + \lambda u = f(u) \quad \text{in } \Omega \subset \mathbb{R}^N$$

with prescribed  $L^2$ -norm

$$(2) \quad \int_{\Omega} u^2 = a$$

has found considerable interest in the last decade. If  $\Omega = \mathbb{R}^N$  and  $V$  is constant then the scaling  $s * u(x) = s^{N/2}u(sx)$  plays an important role in proving the Palais-Smale condition for the associated functional on the  $L^2$ -sphere. We present recent results on the existence of solutions of (1)-(2) on bounded domains where this scaling cannot be used.

The talk is based on work with Shijie Qi and Wenming Zou.