

Sign-changing Solutions of Nonlinear Schrödinger-Poisson Systems in \mathbb{R}^3

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We discuss the sign-changing solutions of the Schrödinger-Poisson system

$$\begin{cases} -\Delta u + V(x)u + \phi u = f(u) & \text{in } \mathbb{R}^3, \\ -\Delta \phi = u^2 & \text{in } \mathbb{R}^3. \end{cases}$$

By using the method of invariant sets of descending flow, we prove that this system has multiple sign-changing solutions. In particular, the nonlinear term includes the power-type nonlinearity $f(u) = |u|^{p-2}u$ for the well-studied case $p \in (4, 6)$ and the less studied case $p \in (2, 4)$, and for the latter case few existence results are available in the literature.

This is joint work with Z.-Q. Wang and Zhaoli Liu.