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Infinitely Many Solutions for Semilinear Δ_γ-Differential Equations in $\mathbb{R}^N$ without the Ambrosetti-Rabinowitz Condition

We study the existence of infinitely many nontrivial solutions of the semilinear Δ_γ-differential equations in $\mathbb{R}^N$

$$-\Delta_\gamma u + b(x)u = f(x,u) \quad \text{in } \mathbb{R}^N,$$

where Δ_γ is the subelliptic operator of the type

$$\Delta_\gamma := \sum_{j=1}^{N} \partial_{x_j}\left(\gamma_j^2 \partial_{x_j}\right), \quad \partial_{x_j} := \frac{\partial}{\partial x_j}, \quad \gamma := (\gamma_1, \gamma_2, ..., \gamma_N),$$

and the potential $b(x)$ and nonlinearity $f(x,u)$ are not assumed to be continuous, moreover f may not satisfy the Ambrosetti-Rabinowitz (AR) condition. Under some growth conditions on b and f, we show that there are infinitely many solutions to the problem.

Keywords: Delta-sub-gamma-Laplace problems, Cerami condition, variational method, weak solutions, Mountain Pass Theorem.

MSC: 35J70, 35J20; 35J10.