SOLITON SOLUTIONS FOR QUASILINEAR SCHRÖDINGER EQUATIONS: THE CRITICAL EXPONENTIAL CASE

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We consider the quasilinear elliptic equation $-\Delta u + V(x)u - (\Delta(|u|^2))u = h(u)$ in $\mathbb{R}^2$, where $V : \mathbb{R}^2 \to \mathbb{R}$ is a positive potential bounded away from zero, and the nonlinearity $h : \mathbb{R} \to \mathbb{R}$ has critical exponential growth, that is, h behaves like $exp(4\pi s^2) - 1$ as $|s| \to \infty$. Under suitable hypotheses and by assuming some asymptotic conditions on V and h, we establish an existence result for the problem above. This result is obtained by combining Ambrosetti-Rabinowitz mountain pass theorem with a version of Trudinger-Moser inequality in $\mathbb{R}^2$.

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