Existence of solution for a generalized quasilinear elliptic problem

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We will establish existence of a solution to the elliptic quasilinear Schrödinger equation

$$-\mathrm{div}(g^2(u)\nabla u) + g(u)g'(u)|\nabla u|^2 + V(x)u = h(x,u), \quad x \in \mathbb{R}^N$$

where g, h, V are suitable smooth functions. The function g is asymptotically linear at infinity and, for each fixed $x \in \mathbb{R}^N$, the function $h(x,s)$ behaves like s at the origin and s^3 at infinity. In the proofs we apply variational methods.