

Variational methods for scaled problems with applications to the Schrodinger–Poisson–Slater equation

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We present novel variational methods for solving scaled equations that do not have the mountain pass geometry, classical linking geometry based on linear subspaces, or Z_2 symmetry, and therefore cannot be solved using classical variational arguments. Our contributions here include critical group estimates, nonlinear saddle point and linking geometries based on scaling, a scaling-based notion of local linking, and scaling-based multiplicity results for symmetric functionals. We develop these methods in an abstract setting involving scaled operators and scaled eigenvalue problems. Applications to subcritical and critical Schrodinger-Poisson-Slater equations are given.

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