

SEMILINEAR ELLIPTIC EQUATIONS ON ANNULI : A REDUCTION METHOD AND CONCENTRATION ON SPHERES

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We show that any general semilinear elliptic problem with Dirichlet or Neumann boundary conditions in an annulus $A \subseteq \mathbb{R}^{2m}$, $m \geq 2$ invariant by the action of a certain symmetry group can be reduced to a nonhomogenous similar problem in an annulus $D \subseteq \mathbb{R}^{m+1}$, invariant by another related symmetry. We apply this result to prove the existence of positive and sign changing solutions of a singularly perturbed elliptic problem in A which concentrate on one or two $(m - 1)$ dimensional spheres. We also prove that the Morse indices of these solutions tend to infinity as the parameter of concentration tends to infinity. These results are in collaboration with P.N. Srikanth.

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