Meeting: 1003, Atlanta, Georgia, SS 28A, AMS-SIAM Special Session on Reaction Diffusion Equations and Applications, I

1003-35-1464 **Yi Li*** (yi-li@uiowa.edu), Department of Mathematics, University of Iowa, Iowa City, IA 52242, and **Chunshan Zhao** (chuzhao@math.uiowa.edu), Department of Mathematics, University of Iowa, Iowa City, IA 52242. *On the shape of least-energy solutions for a class of singularly perturbed quasilinear elliptic Neumann problems.*

We study the shape of least-energy solutions to the quasilinear elliptic equation $\varepsilon^m \Delta_m u - u^{m-1} + f(u) = 0$ with homogeneous Neumann boundary condition as $\varepsilon \to 0^+$ in a smooth bounded domain Ω of R^N. First, we present a sharp upper bound for the energy of the least-energy solutions as $\varepsilon \to 0^+$, and find that this upper bound is closely related to mean curvature of the boundary $\partial\Omega$. Second, we show that the least-energy solutions concentrate on a point on $\partial\Omega$ as $\varepsilon \to 0^+$. Third, we give an approximation result and find that as $\varepsilon \to 0^+$ the least-energy goes to zero exponentially except one point on $\partial\Omega$. Finally, we present some symmetry properties of the least-energy solutions when Ω has some kinds of symmetry. (Received October 05, 2004)