

Bubbling on Boundary Submanifolds for the Lin-Ni-Takagi Problem at Higher Critical Exponents

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(Submitted on 27 Jul 2011 (v1), last revised 29 Jul 2011 (this version, v2))

We consider the equation $d^2\Delta u - u + u^{\frac{n-k+2}{n-k-2}} = 0$, $\text{in } \Omega$, under zero Neumann boundary conditions, where Ω is open, smooth and bounded and d is a small positive parameter. We assume that there is a k -dimensional closed, embedded minimal submanifold K of $\partial\Omega$, which is non-degenerate, and certain weighted average of sectional curvatures of $\partial\Omega$ is positive along K . Then we prove the existence of a sequence $d=d_j \rightarrow 0$ and a positive solution u_d such that $d^2 \|\nabla u_d\|^2 \rightarrow S$, $\delta_K \rightarrow 0$ in the sense of measures, where δ_K stands for the Dirac measure supported on K and S is a positive constant.

Comments: 57 pages

Subjects: **Analysis of PDEs (math.AP)**

MSC classes: 35J20, 35J60

Cite as: **arXiv:1107.5566 [math.AP]**

(or **arXiv:1107.5566v2 [math.AP]** for this version)

Submission history

From: Fethi Mahmoudi [[view email](#)]

[v1] Wed, 27 Jul 2011 19:26:57 GMT (50kb)

[v2] Fri, 29 Jul 2011 04:52:44 GMT (50kb)

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