Gradient bounds and large solutions for a quasilinear elliptic equations

Tommaso Leonori

Tommaso Leonori (tleonori@math.uc3m.es)
Departamento de Matemáticas, Universidad Carlos III

Abstract. I want to discuss some results concerning the so called large solutions (i.e. solutions that uniformly blow-up at the boundary) associated to the equation

$$\lambda u - \Delta_p u + H(x, u) = 0 \qquad \text{in } \Omega\,,$$

where $\Delta_p$is the p-laplacian, Ω is a smooth bounded domain of $\mathbb{R}^N$, $N \geq 3$, $p \geq 2$, $\lambda > 0$ and $H(x, \xi)$ is a Carathodory function on which we will make suitable assumptions.

We are interested in existence, uniqueness and boundary behavior. Moreover we study the stability as λ tends to 0 of such solutions (this problem is known in literature as "ergodic problem").

References

[1] J.M. Lasry, P.-L. Lions; Nonlinear elliptic equations with singular boundary conditions and stochastic control with state constraints. I. The model problem. Math. Ann. **283** (1989), 583–630.

[2] T. Leonori; *Large solutions for a class of nonlinear elliptic equations with gradient terms*, Adv. Nonlin. Stud. **7**(2007), 237–269.

[3] T. Leonori, A. Porretta; Large solutions and gradient bounds for quasilinear elliptic equations *Submitted* .

[4] P.-L. Lions; *Quelques remarques sur les problémes elliptiques quasilinèaires du second ordre*, J. Anal. Math. **45** (1985), 335–353.