

Reduced measures for semilinear elliptic equations with Dirichlet operator

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We are concerned with existence and nonexistence results for equations of the form

$$- Au = f(x, u) + \mu, \quad (1)$$

where A is a general self-adjoint Dirichlet operator on $L^2(E; m)$, $f : E \times \mathbb{R} \rightarrow \mathbb{R}$ is a measurable function which is continuous and nonincreasing with respect to the second variable, and μ is a Borel measure.

We first give a probabilistic definition of a solution to (1) and briefly describe the notion of reduced measure for (1) (in case $A = \Delta$ this notion was introduced by H. Brezis, M. Marcus and A.C. Ponce [1]). Then we give a complete characterization of the class of measures for which there exists a solution to (1) in the case, where f has polynomial growth with respect to the second variable.

REFERENCES

- [1] Brezis, H., Marcus, M., Ponce, A.C.: Nonlinear elliptic equations with measures revisited. In: *Mathematical Aspects of Nonlinear Dispersive Equations* (J. Bourgain, C. Kenig, S. Klainerman, eds.), *Annals of Mathematics Studies*, **163**, Princeton University Press, Princeton, NJ, 55–110 (2007)