Existence results for nonlinear elliptic equations with measure valued absorption potential

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We study the semilinear elliptic equation

$$-\Delta u + g(u)\sigma = \mu$$

with Dirichlet boundary condition in a smooth bounded domain where σ is a nonnegative Radon measure, μ a Radon measure and g is an absorbing nonlinearity. We show that the problem is well posed if we assume that σ belongs to some Morrey class. Under this condition we give a general existence result for any bounded measure provided g satisfies a subcritical integral assumption. We study also the supercritical case when $g(r) = |r|^{q-1}r$, with $q > 1$ and μ satisfies an absolute continuity condition expressed in terms of some capacities involving σ.

This is a joint work with Laurent Véron[1] (LMPT - Université François Rabelais, Tours, France).

References

[1] N. SAINTIER AND L. VÉRON, *Nonlinear elliptic equations with measure valued absorption potential.* `https://arxiv.org/pdf/1803.03150.pdf`.

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