

SEMINÁRIO DE ANÁLISE

On stability of compact supported solutions for non-Lipschitz evolution problems

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Abstract. In this talk we discuss compactly supported ground state solutions (i.e. minimizing the energy and with gradient vanishing on the boundary of the domain) of the Dirichlet problem associated to some semilinear autonomous elliptic equations with a strong absorption term given by a non-Lipschitz function. We show that compactly supported ground state solutions of parabolic problems are unstable for dimensions $N = 1, 2$ and they can be stable for $N \geq 3$ with suitable values of the involved exponents. The method is based on variational methods where a crucial role plays Pohozaev's identity and some fibering type arguments.

The talk is based on joint work with J. I. Díaz, Y. Egorov, J. Hernández [1,2,3].

References

- [1] J. I. Díaz, J. Hernández and Y. Sh. Il'yasov, On the existence of positive solutions and solutions with compact support for a spectral nonlinear elliptic problem with strong absorption, *Nonl. Anal.: Th., Meth. & Appl.* **119** (2015), 484–500.
- [2] J. I. Díaz, J. Hernández and Y. Sh. Il'yasov, Stability criteria on flat and compactly supported ground states of some non-Lipschitz autonomous semilinear equations, *Chinese Ann. Math.* **38** (2017), 345-378.
- [3] Y. Sh. Ilyasov and Y. Egorov, Hopf maximum principle violation for elliptic equations with non-Lipschitz nonlinearity, *Nonlin. Anal.* **72** (2010) 3346-3355.