

# EXISTENCE RESULTS FOR STURM-LIOUVILLE EQUATIONS WITH MIXED BOUNDARY CONDITIONS

ELISABETTA TORNATORE

We consider the Sturm-Liouville problem with mixed boundary conditions and involving the ordinary  $p$ -Laplacian

$$\begin{cases} -(q|u'|^{p-2}u')' + s|u|^{p-2}u = \lambda f(x, u) & \text{on } ]a, b[ \\ u(a) = u'(b) = 0, \end{cases}$$

with  $p > 1$ ,  $q, s \in L^\infty([a, b])$ , with  $q_0 = \text{ess\,inf}_{[a,b]} q > 0$  and  $s_0 = \text{ess\,inf}_{[a,b]} s \geq 0$ . Here the nonlinearity  $f : [a, b] \times \mathbb{R} \rightarrow \mathbb{R}$  is an  $L^1$ -Carathéodory function and  $\lambda$  is a real positive parameter.

Under suitable assumption on  $f$  the existence of two non-zero solutions is obtained using the two critical points theorem established in [1].

These results have been obtained in collaboration with Prof. G. D'Agù and A. Sciammetta.

## REFERENCES

- [1] G. Bonanno, G. D'Agù, *Two non-zero solutions for elliptic Dirichlet problems*, *Z. Anal. Anwend* **35** (2016), 449–464.
- [2] G. D'Agù - A. Sciammetta - E. Tornatore *Two non-zero solutions for Sturm-Liouville equations with mixed boundary conditions* pre-print.