Analysis Seminar

# Multiplicity for a strongly singular quasilinear problem via bifurcation theory

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Time: 10:00 am

On-line at Zoom

**Abstract**. A $p$-Laplacian elliptic problem in the presence of both strongly singular and $(p-1)$-superlinear nonlinearities is considered. We employ bifurcation theory, approximation techniques and sub-supersolution method to establish the existence of an unbounded branch of positive solutions, which is bounded in positive $\lambda-$direction and bifurcates from infinity at $\lambda = 0$. As consequence of the bifurcation result, we determine intervals of existence, nonexistence and, in particular cases, global multiplicity.

# References

[1] M. G. Crandall, P. H. Rabinowitz and L. Tartar, *On a Dirichlet problem with a singular nonlinearity*. Comm. Partial Differential Equations 2 ( 1977), 193–222.

[2] P. H. Rabinowitz, *Some global results for nonlinear eigenvalue problems*. J. Functional Analysis 7 (1971), 487–513.

[3] G. T. Whyburn, *Topological analysis*. Princeton Mathematical Series. No. 23. Princeton University Press, Princeton, N. J., 1958.