

# The one-dimensional $p$ -Laplacian with indefinite weight

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Eigenvalue problems for the finite interval and half-line equation

$$-(|y'(x)|^{p-1} \operatorname{sgn} y'(x))' = (p-1)(\lambda r(x) - q(x))|y(x)|^{p-1} \operatorname{sgn} y(x),$$

for  $1 < p < \infty$ , will be considered. Here we allow the weight  $r$  to be locally integrable and definite, semidefinite or indefinite. Prüfer angle and variational techniques are used. The above considerations leads naturally to the definition and study of the complex  $p$ -Laplacian, as well as the Jordan structure of the eigenspaces for this non-linear problem.

This talk is based on joint work with Paul Binding and Patrick Browne.