Local analytic solutions to some nonhomogeneous problems with *p*-Laplacian

Gabriella Bognar

Miskolc, Hungary

We consider the quasilinear differential equation

$$\Delta_p u + (-1)^i |u|^{q-1} u = 0, \ u = u(x), \ x \in \mathbf{R}^n,$$
(1)

where $n \ge 1$, p and q are real numbers satisfying p > 0, q > 0, i = 0, 1 and Δ_p denotes the p-Laplacian. If n = 1, then (1) is reduced to

$$(|y|^{p-1}y)' + (-1)^i |y|^{q-1}y = 0.$$

If n > 1, then we restrict our attention to radially symmetric solutions, the problem (1) under consideration reduces to

$$\left(t^{n-1}|y|^{p-1}y\right)' + (-1)^{i}t^{n-1}|y|^{q-1}y = 0, \ t > 0.$$

We study the existence of an unique analytic solutions of differential equations satisfying initial conditions y(0) = 0, y'(0) = 1, or y(0) = 1, y'(0) = 0 near zero and we give a constructive procedure for calculating y in power series near zero.