A Dirichlet problem on the half-line for nonlinear second-order differential equations

Zuzana Došlá

Brno, Czech Republic

e-mail: dosla@math.muni.cz

We study the existence of positive solutions on the half-line $[0, \infty)$ for the nonlinear second order differential equation

$$\big(a(t)x'\big)' + b(t)F(x) = 0, \quad t \geq 0,$$

satisfying Dirichlet type conditions, say $x(0) = 0$, $\lim_{t\to\infty} x(t) = 0$. The function b is allowed to change sign and the nonlinearity F is assumed to be asymptotically linear in a neighborhood of zero and infinity. Our results cover also the cases in which b is a periodic function for large t or it is unbounded from below.