Local and global estimates for modified Riccati equation in half-linear oscillation theory

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We present several types of estimates for a nonlinear function appearing in the so-called modified Riccati equation associated with the half-linear equation of the form

$$(r(t)\Phi(x'))' + c(t)\Phi(x) = 0, \quad \Phi(x) := |x|^{p-2}x, \ p > 1.$$

The estimated function is closely related to the function $P(a,b) = \frac{|a|^p}{p} - ab + \frac{|b|^q}{q}$, where $\frac{1}{p} + \frac{1}{q} = 1$, from the Young inequality. We show some applications of these estimates in the oscillation theory of half-linear equations. The presented results were achieved in the joint research with Ondřej Došlý and Robert Mařík.

References

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