

Graef, John R.

Limit circle type results for sublinear equations. (English) Zbl 0535.34024
Pac. J. Math. 104, 85-94 (1983).

The author considers forced second order nonlinear equations of the type $(a(t)x')' + q(t)f(x) = r(t)$ and calls them of nonlinear limit circle type if every solution $x(t)$ has $\int_{t_0}^{\infty} x(u)f(x(u))du < \infty$ and of nonlinear limit point type otherwise (this definition generalizes *H. Weyl's* [Math. Ann. 68, 220-269 (1910)] classification of second order linear differential equations $(a(t)x')' + q(t)x = 0$). The author considers the sublinear case $f(x) = x^\gamma$, $0 < \gamma \leq 1$. Necessary and sufficient conditions are found that such a forced or unforced ($r = 0$) equation is of nonlinear limit circle type and also sufficient conditions that it is of nonlinear limit point type.

Reviewer: [M.Boudourides](#)

MSC:

- [34C05](#) Topological structure of integral curves, singular points, limit cycles of ordinary differential equations Cited in 7 Documents
- [34A34](#) Nonlinear ordinary differential equations and systems
- [34A30](#) Linear ordinary differential equations and systems

Keywords:

[limit cycle](#); [limit circle](#); [second order linear differential equations](#); [nonlinear limit point](#)

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