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Pachpatte inequalities on time scales. (English) Zbl 1086.34014

JIPAM, J. Inequal. Pure Appl. Math. 6, No. 1, Paper No. 6, 23 p. (2005).

The authors prove a variety of inequalities within the context of the calculus on time scales. Here, the involved functions are assumed to be defined on arbitrary closed subsets \mathbb{T} of the reals and the crucial notion is the so-called delta derivative generalizing the usual derivative (for $\mathbb{T} = \mathbb{R}$) and the forward difference operator (for $\mathbb{T} = \mathbb{Z}$).

More precisely, comparison principles are used to derive time scale versions of certain inequalities, which in the special cases $\mathbb{T} = \mathbb{R}$ or $\mathbb{T} = \mathbb{Z}$ date back to Gronwall, Gamidov (or in the discrete case, to Pachpatte), Gollwitzer, Norbury and Stuart (Volterra-type inequalities), Green (in the discrete case, to Pachpatte) and Ma. These results are supplemented by several corollaries. Finally, also inequalities involving first- and second-order delta derivatives are addressed (originally due to Pachpatte).

Reviewer: [Christian Pötzsche \(Minneapolis\)](#)

MSC:

34A40 Differential inequalities involving functions of a single real variable

39A10 Additive difference equations

39A13 Difference equations, scaling (q -differences)

Cited in **47** Documents

Keywords:

[time scales](#); [Pachpatte inequalities](#); [dynamic inequalities](#)

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