Title: A connection between weighted Hardy's inequality and half-linear dynamic Equations

Authors: S. H. Saker and **R. R. Mahmoud**

Abstract.

In this paper, we give an affirmative answer to the following question: Is the solvability of some nonlinear dynamic equations on a time scale $\mathbb{T}$ not only sufficient but in a certain sense also necessary for the validity of some dynamic Hardy-type inequalities with two different weights? In fact, this answer will give a new characterization of the weights in a weighted Hardy-type inequality on time scales. The results contain the results when $\mathbb{T} = \mathbb{R}$, $\mathbb{T} = \mathbb{N}$, and when $\mathbb{T} = q^{\mathbb{N}_0}$ as special cases. Some applications are given for illustrations.