The Role of an Integral Inequality in the Study of Certain Differential Equations

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Abstract: In this paper we present an integral inequality and show how it can be used to study certain differential equations. Namely, we will see how to establish (global) existence results and determine the decay rates of solutions to abstract semilinear problems, reaction diffusion systems with time dependent coefficients and fractional differential problems. A nonlinear singular version of the Gronwall inequality is also presented.

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