

**EXISTENCE AND UNIQUENESS THEOREMS FOR
DIFFERENTIAL EQUATIONS OF FRACTIONAL ORDER
IN WEIGHTED SPACES OF CONTINUOUS FUNCTIONS**

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Dedicated to 75th birthday of Professor Paul L. Butzer

Abstract

The paper is devoted to the study of the Cauchy-type problem for the nonlinear differential equation of complex order with the Riemann-Liouville fractional derivative in the weighted space of continuous functions on a finite interval of the real axis. The equivalence of this problem and the nonlinear Volterra integral equation is established. On the basis of this the existence and uniqueness of the solution of the considered Cauchy-type problem is proved. The corresponding assertions for the ordinary differential equations are presented. Examples are given.

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