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ON THE STRUCTURE OF THE SET OF SOLUTIONS OF THE WEIGHTED CAUCHY PROBLEM FOR HIGH ORDER EVOLUTION SINGULAR FUNCTIONAL DIFFERENTIAL EQUATIONS

In the paper there is investigated the structure of the set of solutions of the Cauchy problem for the weighted initial condition

$$u^{(n)}(t) = f(u)(t),$$

$$\lim_{t\to a} \frac{u^{(k)}(t)}{h^{(k)}(t)} = 0 \quad (k = 0, \ldots, n-1),$$

where $f : C^{n-1}([a,b];\mathbb{R}^m) \to L_{loc}(]a,b];\mathbb{R}^{\geq})$ is a continuous Volterra operator and $h : [a,b] \to [0,+\infty[$ is an $(n-1)$-times continuously differentiable function such that

$$h^{(k)}(a) = 0 \quad (k = 0, \ldots, n-2), \quad h^{(n-1)}(t) > 0 \ \text{ for } \ a < t \leq b.$$