ON A TWO-POINT BOUNDARY VALUE PROBLEM FOR SYSTEMS OF LINEAR GENERALIZED ORDINARY DIFFERENTIAL EQUATIONS WITH SINGULARITIES

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For a system of linear generalized (in J. Kurzweil sense) ordinary differential equations with singularities

$$dx(t) = dA(t) \cdot x(t) + df(t)$$

we consider the two-point boundary value problem

$$x_i(a+) = 0, \quad x_i(b-) = 0 \ \ (i = 1, \dots, n),$$

where $-\infty < a < b < +\infty$, $x_1, ..., x_n$ are the components of the desired solution $x, f = (f_l)_{l=1}^n : [a, b] \to \mathbb{R}^n$ and $A = (a_{il})_{i,l=1}^n : [a, b] \to \mathbb{R}^{n\times n}$ are vector and matrix-functions such that the components f_l and $a_{il}\,(i \neq l; i, l = 1, \dots, n)$ have bounded variations on the closed interval $[a, b]$, and the diagonal components $a_{ii}\,(i = 1, ..., n)$ of the matrix-function A have bounded variations on the every closed interval from $[a, b]$, but they maybe have unbounded variation on the whole interval $[a, b]$. The singularities are understand in this sense.

There are given a general theorem and effective criteria for the solvability of the problem.

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