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DIRICHLET BOUNDARY VALUE PROBLEM FOR A SYSTEM OF N THE SECOND ORDER ASYMPTOTICALLY ASYMMETRIC DIFFERENTIAL EQUATIONS

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We consider systems of the form

$$\begin{cases} x_1'' + g_1(x_1) = h_1(x_1, x_2, \dots, x_n), \\ x_2'' + g_2(x_2) = h_2(x_1, x_2, \dots, x_n), \\ \qquad\qquad \dots \\ x_n'' + g_n(x_n) = h_n(x_1, x_2, \dots, x_n) \end{cases}$$

along with the boundary conditions

$$x_1(0) = x_2(0) = \dots = x_n(0) = 0 = x_1(1) = x_2(1) = \dots = x_n(1)$$

provided that continuous right sides $h_i(x_1, x_2, \dots, x_n)$ $(i = 1, 2, \dots, n)$ are bounded and satisfy the conditions $h_i(0, 0, \dots, 0) = 0$ $(i = 1, 2, \dots, n)$. We suppose that $g_i(x_i)$ $(i = 1, 2, \dots, n)$ asymmetric asymptotically linear functions, therefore at infinity the left sides behave like Fučík equations. We provide the existence results using the vector field rotation theory.

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