ANALOGUE OF JORDAN-DIRICHLET'S THEOREM
FOR THE FIRST ORDER DIFFERENTIAL OPERATOR
DEFINED ON THE GRAPH

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Let L be the first order differential operator defined on Γ, $Ly(x) = y'(x)$, $x \in \Gamma$, with the boundary condition connecting limit values of $y(x)$ into the nodes of Γ.

The problem of decomposability of a function $f(x)$ being continuous on Γ into Fourier series with respect to the system of eigenfunctions of the operator L is studied. To investigate the convergence of this Fourier series the method of contour integral is used. In this problem the boundary condition is not regular in the sense of Birkhoff, so some difficulties generated by the exponential growth of the resolvent for large values of $|\lambda|$ appear.

In this paper the sufficient condition of the convergence of Fourier series of function $f(x)$ is obtained. Namely, it is proved the analogue of the famous Jordan-Dirichlet's theorem which is applicable to the problems on graphs.