On Generalized Resolvents and Characteristic Matrices of Differential Operators

The main object of our considerations are differential operators generated by a formally selfadjoint differential expression of an even order on the interval \([0, b]\) \((b \leq \infty)\) with operator valued coefficients. We complement and develop the known Shtraus’ results on generalized resolvents and characteristic matrices of the minimal operator \(L_0\). Our approach is based on the concept of a decomposing boundary triplet [1] which enables to establish a connection between the Shtraus’ method and boundary value problems (for singular differential operators) with a spectral parameter in a boundary condition. In particular we provide a parametrization of all characteristic matrices \(\Omega(\lambda)\) of the operator \(L_0\) immediately in terms of the Nevanlinna boundary parameter \(\tau(\lambda)\). Such a parametrization is given in the form of the block-matrix representation of \(\Omega(\lambda)\) as well as by means of the formula for \(\Omega(\lambda)\) similar to the well known Krein-Naimark formula for generalized resolvents.