STIELTJES LIKE FUNCTIONS AND INVERSE PROBLEMS FOR SYSTEMS WITH SCHRÖDINGER OPERATOR

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Abstract. A class of scalar Stieltjes like functions is realized as linear-fractional transformations of transfer functions of conservative systems based on a Schrödinger operator $T_h$ in $L^2[a, +\infty)$ with a non-selfadjoint boundary condition. In particular it is shown that any Stieltjes function of this class can be realized in the unique way so that the main operator $A$ of a system is an accretive ($\ast$) extension of a Schrödinger operator $T_h$. We derive formulas that restore the system uniquely and allow to find the exact value of a non-real parameter $h$ in the definition of $T_h$ as well as a real parameter $\mu$ that appears in the construction of the elements of the realizing system. An elaborate investigation of these formulas shows the dynamics of the restored parameters $h$ and $\mu$ in terms of the changing free term $\gamma$ from the integral representation of the realizable function. It turns out that the parametric equations for the restored parameter $h$ represent different circles whose centers and radii are determined by the realizable function. Similarly, the behavior of the restored parameter $\mu$ are described by hyperbolas.


Key words and phrases: Operator colligation, conservative and impedance system, transfer (characteristic) function.

REFERENCES


