

SCATTERING AND INVERSE SCATTERING FOR A LEFT-DEFINITE STURM-LIOUVILLE PROBLEM

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This talk reports on a scattering and an inverse scattering theory for the Sturm–Liouville equation with a weight that changes sign, but with non negative potential. The crucial ingredient of the approach is a generalized transform built on the Jost solutions of the problem and hence termed the Jost transform and the associated Paley–Wiener theorem linking growth properties of transforms with support properties of functions. One motivation for this investigation comes from the Camassa–Holm equation for which the solution of the Cauchy problem can be achieved by the inverse scattering transform of a certain Sturm-Liouville problem