

# Canonical systems on a finite interval: accelerants and continuous potentials

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The notion of an accelerant has been introduced by M.G. Krein in the mid fifties. By definition it is a continuous function  $k$  on a finite interval  $[-\mathbf{T}, \mathbf{T}]$  such that the corresponding convolution integral operator

$$(Tf)(t) = f(t) - \int_0^{\mathbf{T}} k(t-s)f(s) ds, \quad 0 \leq t \leq \mathbf{T},$$

is positive definite on  $L^2(0, \mathbf{T})$ . For such a kernel function the corresponding canonical system of Krein type has a continuous potential on  $[0, \mathbf{T}]$ . In this talk we deal with the following inverse problem: Is each continuous potential on  $[0, \mathbf{T}]$  generated by an accelerant. We shall see that after an appropriate modification of the definition the answer is positive, even for matrix-valued kernel functions. Moreover, the accelerant is uniquely determined by the potential.

The talk is based on joint work with D. Alpay, I. Gohberg, L. Lerer, and A.L. Sakhnovich.