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Scattering theory for differential and integral operators

Abstract: We study spectral properties of the Carleman operator (the Hankel operator with kernel $h_0(t) = t^{-1}$) and, in particular, find an explicit formula for its resolvent. Then we consider perturbations of the Carleman operator H_0 by Hankel operators V with kernels $v(t)$ decaying sufficiently rapidly as $t \to \infty$ and not too singular at $t = 0$. Our goal is to develop scattering theory for the pair H_0, $H = H_0 + V$ and to construct an expansion in eigenfunctions of the continuous spectrum of the Hankel operator H. The theory constructed is somewhat analogous to the theory of one-dimensional differential operators.