

Stability of contractive lines in Hilbert space

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Let $T_t, 0 \leq \infty$ be a semigroup of contractions in a Hilbert (or Krein) space \mathcal{H} and let e be some non-zero vector from \mathcal{H} . By the contractive line (contractive process) in \mathcal{H} we mean the vector function $T_t e, 0 \leq t < \infty$. A line (process) is called *stable* if the unitary part of semigroup T_t on the invariant subspace formed by values of $T_t e$ has no point spectrum and *unstable* otherwise.

We give a natural criterion of line (process) stability in terms of its correlation function $\varphi(t, s) := (T_t e, T_s e), 0 \leq t, s < \infty$.