Kalle M. Mikkola: *Hankel and Toeplitz operators on nonseparable Hilbert spaces: further results*; Helsinki University of Technology, Institute of Mathematics, Research Reports A528 (2007).

Abstract: *We show that every operator that acts between two nonseparable Hilbert spaces can be "block diagonalized", where each diagonal block acts between two separable Hilbert spaces. Analogous results hold for operator-valued* $\mathcal{H}^\infty$, $\mathrm{L}^\infty_{\mathrm{strong}}$, $\mathcal{H}^p_{\mathrm{strong}}$ *and* $\mathrm{L}^p_{\mathrm{strong}}$ *functions and others.*
Using these results, several theorems about representation, interpolation, invertibility, factorization etc., which have previously been known only for separable Hilbert spaces, can now be generalized to arbitrary Hilbert spaces. We generalize several results often needed in systems and control theory, including the Nehari (or Page) Theorem, the Adamjan–Arov–Krein Theorem, the Hartman Theorem, the Lax–Halmos Theorem, Tolokonnikov's Lemma and the inner-outer factorization. We present our results both for the unit circle/disc and for the real line/half-plane.

AMS subject classifications: 47B35, 46C99, 46E40.

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Correspondence

Helsinki University of Technology Institute of Mathematics
P.O. Box 1100; FIN-02015 HUT, Finland
GSM: +358-40-7545660, fax: +358-9-451 3016
http://www.math.hut.fi/~kmikkola/

Kalle.Mikkola@iki.fi

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Helsinki University of Technology
Department of Engineering Physics and Mathematics
Institute of Mathematics
P.O. Box 1100, FI-02015 TKK, Finland
email:math@tkk.fi http://math.tkk.fi/