

A CLASS OF INTEGRO–MULTIPLICATION OPERATORS

GREGORY T. ADAMS, NATHAN S. FELDMAN AND PAUL J. MCGUIRE*

Abstract. This paper introduces a class of Integro-multiplication operators on Hilbert spaces of analytic functions with reproducing kernels of the form

$$K_{\varphi}(z, w) = \sum_{n=0}^{\infty} f(z)\overline{f(w)} \quad \text{with} \quad f(z) = (n+1)z^n + \varphi(z)z^{n+1},$$

where $\varphi \in H^{\infty}(\mathbb{D})$. Hyponormality and subnormality of the operators is explored in some special cases, particularly the case where $\varphi(z) = 1$. Additionally the idea of M -dominating matrices is introduced as a means of establishing the norms of these operators.

Mathematics subject classification (2020): Primary 47B20, 47C15.

Keywords and phrases: Analytic reproducing kernel, subnormal operator, tridiagonal kernel, hyponormal operator, differential operator, integral operator, perturbation.

REFERENCES

- [1] G. T. ADAMS, P. J. MCGUIRE, *Analytic tridiagonal reproducing kernels*, Proc. London Math. Soc., **64** no. 3 (2001), 722–738.
- [2] G. T. ADAMS, P. J. MCGUIRE, V. I. PAULSEN, *Analytic reproducing kernels and multiplication operators*, Illinois J. Math., **36** no. 3 (1992), 404–419.
- [3] N. ARONSZAJN, *Theory of reproducing kernels*, Trans. A.M.S., **68** (1950), 337–404.
- [4] J. B. CONWAY, *The Theory of Subnormal Operators*, Amer. Math. Soc., Providence, RI, 1991.
- [5] A. LAMBERT, *Subnormality and weighted shifts*, J. London Math. Soc., **14** (1976), 476–480.
- [6] A. L. SHIELDS, *Weighted shift operators and analytic function theory*, in Topics in operator theory (C. Pearcy, Ed.), Math. Surveys, vol. 13, A.M.S., Providenc, R.I., 1974, 49–128.
- [7] A. L. SHIELDS, L. J. WALLEN, *The commutants of certain Hilbert space operators*, Indiana Univ. Math. J., vol. 20, no. 9 (1971), 777–788.
- [8] R. L. SCHILLING, R. SONG, Z. VONDRAČEK, *Bernstein Functions*, Studies in Math. **37**, De Gruyter, Berlin, Germany, 2010.
- [9] D. V. WIDDER, *The Laplace Transform*, Princeton Univ. Press, Princeton, NJ, 1941.