

FUGLEDE–PUTNAM THEOREM AND

QUASIMILARITY OF CLASS $p\text{-}wA(s,t)$ OPERATORS

M. CHŌ, T. PRASAD, M. H. M. RASHID, K. TANAHASHI AND A. UCHIYAMA

Abstract. We show that $p\text{-}wA(s,t)$ operators S, T^* ($s+t \leq 1$, $0 < p \leq 1$) with $\ker(S) \subseteq \ker(S^*)$ and $\ker(T^*) \subseteq \ker(T)$ satisfy Fuglede–Putnam theorem, i.e., $SX = XT$ for some X implies $S^*X = XT^*$. Also, we show that two quasimimilar $p\text{-}wA(s,t)$ operators S, T ($s+t \leq 1$, $0 < p \leq 1$) with $\ker(S) \subseteq \ker(S^*)$ and $\ker(T) \subseteq \ker(T^*)$ have equal spectra and essential spectra.

Mathematics subject classification (2010): 47B20, 47A62.

Keywords and phrases: p -hyponormal operator, class $p\text{-}wA(s,t)$ operator, Fuglede–Putnam theorem, quasimimilar.

REFERENCES

- [1] A. ALUTHGE, *On p -hyponormal operators for $0 < p < 1$* , Integral Equations Operator Theory **13** (1990), 307–315.
- [2] A. ALUTHGE AND D. WANG, *w-hyponormal operators*, Integral Equations Operator Theory **36** (2000), 1–10.
- [3] M. CHŌ, M. H. M. RASHID, K. TANAHASHI AND A. UCHIYAMA, *Spectrum of class $p\text{-}wA(s,t)$ operators*, Acta Sci. Math. (Szeged), **82** (2016), 641–659.
- [4] J. B. CONWAY, *The theory of subnormal operators*, Mathematical surveys and monographs **36**, AMS, 1991.
- [5] B. P. DUGGAL, *Quasi-similar p -hyponormal operators*, Integral Equations and Operator Theory, **26**(1996), 338–345.
- [6] M. FUJII, D. JUNG, S. H. LEE., M. Y. LEE., AND R. NAKAMOTO, *Some classes of operators related to paranormal and log hyponormal operators*, Math. Japon. **51** (2000), 395–402.
- [7] T. FURUTA, M. ITHO AND T. YAMAZAKI, *A subclass of paranormal operators including class of log-hyponormal and several related classes*, Scientiae Mathematicae **1** (1998), 389–403.
- [8] M. ITO, *Some classes of operators with generalised Aluthge transformations*, SUT J. Math. **35** (1999), 149–165.
- [9] I. H. JEON AND B. P. DUGGAL, *p -hyponormal operators and quasimilarity*, Integral Equations Operator Theory **49** (2004), 397–403.
- [10] I. H. JEON, K. TANAHASHI, AND A. UCHIYAMA, *On quasimilarity for log-hyponormal operators*, Glasgow Math. J. **46** (2004), 169–176.
- [11] K. B. LAURSEN AND M. N. NUemann, *Introduction to local spectral theory*, Clarendon Press, Oxford, 2000.
- [12] T. PRASAD AND K. TANAHASHI, *On class $p\text{-}wA(s,t)$ operators*, Functional Analysis, Approximation Computation, **6** (2) (2014), 39–42.
- [13] S. M. PATEL, K. TANAHASHI, A. UCHIYAMA AND M. YANAGIDA, *Quasinormality and Fuglede–Putnam theorem for class $A(s,t)$ operators*, Nihonkai Math. J. **17** (1) (2006), 49–67.
- [14] T. PRASAD, M. CHŌ, M. H. M. RASHID, K. TANAHASHI AND A. UCHIYAMA, *Class $p\text{-}wA(s,t)$ operators and range kernel orthogonality*, Scientiae Mathematicae Japonicae e-2017 (30) 2017–13.
- [15] M. H. M. RASHID, *Class $wA(s,t)$ operators and quasimilarity*, Port Math. 2012; 69: 305–320.
- [16] M. H. M. RASHID, M. CHO, T. PRASAD, K. TANAHASHI AND A. UCHIYAMA, *Weyl's theorem and Putnam's inequality for $p\text{-}wA(s,t)$ operators*, Acta Sci. Math. (Szeged) **84**(2018), 573–589.

- [17] J. G. STAMPFLI, *Quasimilarity of operators*, Proc. Royal Irish Acad. **81A** (1) (1981), 109–119.
- [18] K. TANAHASHI, T. PRASAD AND A. UCHIYAMA, *Quasinormality and subscalarity of class p - $wA(s,t)$ operators*, Functional Analysis, Approximation Computation **9** (1) (2017), 61–68.
- [19] A. UCHIYAMA, K. TANAHASHI, *Fuglede-Putnam's theorem for p -hyponormal or log-hyponormal operators*, Glasgow Math. J. **44** (2002), 397–410.
- [20] M. YANAGIDA, *Powers of class $wA(s,t)$ operators with generalised Aluthge transformation*, J. Inequal. Appl. **7** (2002), 143–168.
- [21] L. R. WILLIAMS, *Quasimilarity and hyponormal operators*, J. Operator Theory, **5** (1981), 127–139.
- [22] L. M. YANG, *Quasimilarity of hyponormal and subdecomposable operators*, J. Funct. Anal. **112** (1993), 204–217.