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FUGLEDE–PUTNAM THEOREM AND QUASISIMILARITY OF CLASS p–$wA(s,t)$ OPERATORS

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Abstract. We show that p-$wA(s,t)$ operators S, T^* $(s+t \leqslant 1,\ 0 < p \leqslant 1)$ 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 quasisimilar p-$wA(s,t)$ operators S, T $(s+t \leqslant 1,\ 0 < p \leqslant 1)$ with $\ker(S) \subseteq \ker(S^*)$ and $\ker(T) \subseteq \ker(T^*)$ have equal spectra and essential spectra.

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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-$wA(s,t)$ 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 Aluthege transformations*, SUT J. Math. **35** (1999), 149–165.
[9] I. H. JEON AND B. P. DUGGAL, *p-hyponormal operators and quasisimilarity*, Integral Equations Operator Theory **49** (2004), 397–403.
[10] I. H. JEON, K. TANAHASHI, AND A. UCHIYAMA, *On quasisimilarity for log-hyponormal operators*, Glasgow Math. J. **46** (2004), 169–176.
[11] K. B. LAURSEN AND M. N. NUEMANN, *Introduction to local spectral theorey*, Clarendon Press, Oxford, 2000.
[12] T. PRASAD AND K. TANAHASHI, *On class p-$wA(s,t)$ 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-$wA(s,t)$ operators and range kernel orthogonality*, Scientiae Mathematicae Japonicae e-2017 (30) 2017–13.
[15] M. H. M. RASHID, *Class $wA(s,t)$ operators and quasisimilarity*, 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-$wA(s,t)$ operators*, Acta Sci. Math. (Szeged) 84(2018), 573–589.

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[17] J. G. STAMPFLI, *Quasisimilarity 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, *Quasisimilarity and hyponormal operators*, J. Operator Theory, **5** (1981), 127–139.
[22] L. M. YANG, *Quasisimilarity of hyponormal and subdecomposable operators*, J. Funct. Anal. **112** (1993), 204–217.