

POLAROID AND $p - \ast$ -PARANORMAL OPERATORS

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Abstract. In this paper we define the $p - \ast$ -paranormal operators and we show some properties of this class of operators. We also prove that a $p - \ast$ -paranormal operator is polaroid and we show a necessary and sufficient condition for the Riesz idempotent associated to a non-zero isolated point of the spectrum of a $p - \ast$ -paranormal operator to be self-adjoint. Finally, we show that generalized a-Weyl's theorem holds for $p - \ast$ -paranormal operators and we present some finite operators.

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REFERENCES

- [1] P. Aiena, *Fredholm and local spectral theory with applications to multipliers*, Kluwer Academic Publishers, Dordrecht, Boston, London, 2004.
- [2] P. Aiena, E. APONTE AND E. BALZAN, *Weyl Type Theorems for left and right Polaroid operators*, Integr. Equat. Operat. Theor. **66** (2010), 1–20.
- [3] P. Aiena, P. O. GARCIA, *Generalized Browder's theorem and SVEP*, *Mediterr.J.Math* **4**, 2 (2007), 215–228.
- [4] ANGUS E. TAYLOR, *Introduction to functional analysis*, John Wiley and Sons, New York, London, Sydney, 1958.
- [5] S. C. ARORA, J. K. THUKRAL, *M^* -Paranormal operators*, *Glas. Math. Ser. III* **22** (1987), 123–129.
- [6] S. C. ARORA, J. K. THUKRAL, *On a class of operators*, *Glas. Math. Ser. III* **21** (1986), 381–386.
- [7] S. C. ARORA, RAMESH KUMAR, *M -Paranormal operators*, *Publ. Inst. Math., Nouvelle serie* **43** (1981), 5–13.
- [8] N. BRAHA, M. LOHAJ, F. MAREVCI, SH. LOHAJ, *Some properties of paranormal and hyponormal operators*, *Bull. Math. Anal. Appl.* **2** (2009), 23–35.
- [9] N. BRAHA AND K. TANAHASHI, *SVEP and Bishop's property for k^* -paranormal operators*, *Oper. Matrices* **5** (2011), 469–472.
- [10] M. BERKANI AND A. ARROUD, *Generalized Weyl's theorem and hyponormal operators*, *J. Austral. Math. Soc* **76** (2004), 291–302.
- [11] M. BERKANI AND J. J. KOLIHA, *Weyl's type theorems for bounded linear operators*, *Acta. Sci. Math.(Szeged)* **69** (2003), 379–391.
- [12] M. BERKANI AND M. SARIH, *On semi B -Fredholm operators*, *Glasgow Math. J* **43** (2001), 457–465.
- [13] X. CAO, M. GUO AND B. MENG, *Weyl type theorems for p -hyponormal and M -hyponormal operators*, *Studia Math* **163** (2004), 177–188.
- [14] M. CHO, M. ITO AND S. OSHIRO, *Weyl's theorem holds for p -hyponormal operators*, *Glasgow Math. J.* **39** (1997), 217–220.
- [15] L. A. COBURN, *Weyl's theorem for nonnormal operators*, *Michigan. Math. J.* **13** (1966), 285–288.
- [16] N. CHENNAPPAN, S. KARTHIKEYAN, *\ast -Paranormal composition operators*, *Indian J. Pure Appl. Math.* **31** (2000), 591–601.
- [17] B. P. DUGALL, I. H. JEON, AND I. H. KIM, *On \ast -paranormal contractions and properties for \ast -class A operators*, *Linear Alg. Appl.*, in press.
- [18] T. FURUTA, M. ITO, T. YAMAZAKI, *A subclass of paranormal operators including class of log-hyponormal and several related classes*, *Sci. Math.* **1** (1998), 389–403.

- [19] 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.
- [20] S. R. FOGUEL, *The relations between a spectral operator and its scalar part*, Pacific J. Math. **8** (1958), 51–65.
- [21] I. GOHBERG, S. GOLDBERG, M. KAASHOEK, *Classes Of Linear Operators*, Vol. 1, Birkhauser, 1993.
- [22] P. R. HALMOS, *A Hilbert space problem book*, Van Nostrand, Princeton 1967.
- [23] Y. M. HAN AND W. Y. LEE, *Weyl's theorem holds for algebraically hyponormal operators*, Proc. Amer. Math. Soc **128** (2000), 2291–2296.
- [24] IN HO JEAN AND IN HYOUN KIM, *On operators satisfying $T^*|T^2|T \geq T^*|T|^2T$* , Linear Algebra Appl. **418** (2006), 854–862.
- [25] S. MECHERI, *Finite operators*, Demonstratio Math **35** (2002), 355–366.
- [26] S. MECHERI, *Finite Operators and Orthogonality*, Nihonkai Math. J. **19** (2008), 53–60.
- [27] S. MECHERI, *Spectral properties of quasi-*-paranormal operators*, submitted.
- [28] P. J. MAHER, *Commutator and Self-commutator II*, Filomat **24** (2010), 1–7.
- [29] C. A. MCCARTHY, c_p , Israel J. Math **5** (1967), 249–271.
- [30] S. PANAYAPPAN AND A. RADHARAMANI, *A Note on p -*- Paranormal Operators and Absolute k -* Paranormal Operators*, Int. J. Math. Anal. (Ruse) **2**, 25–28 (2008), 1257–1261.
- [31] K. TANAHASHI, *On log-hyponormal operators*, Integr. equ. oper. theory **34** (1999), 364–372.
- [32] V. RAKOČEVIĆ, *Operators obeying a-Weyl's theorem*, Rev. Roumaine Math. Pures Appl. **10** (1989), 915–919.
- [33] J. STAMPFLI, *Hyponormal operators and spectral density*, Trans. Amer. Math. Soc **117** (1965), 469–476.
- [34] A. UCHIYAMA, *On isolated points of the spectrum of paranormal operators*, Integral Equations and Operator Theory **55** (2006), 145–151.
- [35] H. WEYL, *Über beschränkte quadratische Formen, deren Differenz vollsteig ist*, Rend. Circ. Mat. Palermo **27** (1909), 373–392.
- [36] J. P. WILLIAMS, *Finite operators*, Proc. Amer. Math. Soc **26** (1970), 129–135.
- [37] H. WIELANDT, *Über die Unbeschränktheit der Operatoren der Quantenmechanik* (German), Math. Ann. **121** (1949), 21.
- [38] JUN LI SHEN, FEI ZUO AND CHANG SEN YANG, *On Operators Satisfying $T^*|T^2|T \geq T^*|T^{*2}|T$* , Acta Mathematica Sinica English Series **26** (2010), 2109–2116.