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Generalized a-Weyl's Theorem and the Single-Valued Extension Property

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Abstract

Let T be a bounded linear operator acting on a Banach space X such that T or T^* has the SVEP. We prove that the spectral mapping theorem holds for the semi-essential approximate point spectrum $\sigma_{SBF_+^-}(T)$, and we show that generalized a-Browder's theorem holds for $f(T)$ for every analytic function f defined on an open neighbourhood U of $\sigma(T)$. Moreover, we give a necessary and sufficient condition for such T to obey generalized a-Weyl's theorem. An application is given for an important class of Banach space operators.

References

[1] Aiena, P., "Fredholm and Local Spectral Theory, with Applications to Multipliers", Kluwer Academic Publishers Dordrecht, 2004.

[2] Aiena, P., Colasante, M.L., González, M., Operators which have a closed quasi-nilpotent part, *Proc. Amer. Math. Soc.* **130** (2002), 2701 – 2710.

[3] Aiena, P., Monsalve, O., Operators which do not have the single valued extension property, *J. Math. Anal. Appl.* **250** (2000), 435 – 448.

[4] Berkani, M., On a class of quasi-Fredholm operators, *Integral Equations Operator Theory* **34** (1999), 244 – 249.

[5] Berkani, M., Arroud, A., Generalized Weyl's theorem and hyponormal operators, *J. Austral. Math. Soc.* **76** (2004), 291 – 302.

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[6] Berkani, M., Koliha, J.J., Weyl type theorems for bounded linear operators, *Acta Sci. Math. (Szeged)* **69** (2003), 359 – 376.

[7] Berkani, M., Sarih, M., On semi B-Fredholm operators, *Glasg. Math. J.* **43** (2001), 457 – 465.

[8] Cao, X., Guo, M., Meng, B., Weyl type for p-hyponormal operators and M-hyponormal operators, *Studia Math.* **163** (2004), 177 – 187.

[9] Djordjević, S.V., Han, Y.M., Browder's theorems and spectral continuity, *Glasg. Math. J.* **42** (2000), 479 – 486.

[10] Dunford, N., Spectral theory I. Resolution of the identity, *Pacific J. Math.* **2** (1952), 559 – 614.

[11] Dunford, N., Spectral operators, *Pacific J. Math.* **4** (1954), 321 – 354.

[12] Grabiner, S., Uniform ascent and descent of bounded operators, *J. Math. Soc. Japan* **34** (1982), 317 – 337.

[13] Heuser, H., "Functional Analysis", John Wiley & Sons, Ltd., Chichester, 1982.

[14] Koliha, J.J., isolated spectral points, *Proc. Amer. Math. Soc.* **124** (1996), 3417 – 3424.

[15] Laursen, K.B., Operators with finite ascent, *Pacific J. Math.* **152** (1992), 323 – 336.

[16] Laursen, K.B., Neumann, M.M., "An Introduction to Local Spectral Theory", London Math. Soc. Monogr. (N.S.) 20, The Clarendon Press, Oxford University Press, New York, 2000.

[17] Lay, D.C., Spectral analysis using ascent, descent, nullity and defect, *Math. Ann.* **184** (1970), 197 – 214.

[18] Mbekhta, M., Généralisation de la décomposition de Kato aux opérateurs paranormaux et spectraux, *Glasg. Math. J.* **29** (1987), 159 – 175.

[19] Mbekhta, M., Sur la théorie spectrale locale et limite de nilpotents, *Proc. Amer. Math. Soc.* **3** (1990), 621 – 631.

[20] Mbekhta, M., Ouahab, A., Opérateurs s-regulier dans un espace de Banach et théorie spectrale, *Acta Sci. Math. (Szeged)* **59** (1994), 525 – 543.

[21] Mbekhta, M., Müler, V., On the axiomatic theory of the spectrum II, *Studia Math.* **119** (1996), 129 – 147.

[22] Müler, V., "Spectral Theory of Linear Operators", Oper. Theory Adv. Appl. 139, Birkhäuser Verlag, Basel, 2003.

[23] Oudghiri, M., Weyl's and Browder's theorem for operators satisfying the SVEP, *Studia Math.* **163** (1) (2004), 85 – 101.

[24] Oudghiri, M., a-Weyl's theorem and the single valued extension property, to appear in *Extracta Math.*

[25] Rakočević, V., Approximate point spectrum and commuting compact perturbations, *Glasg. Math. J.* **28** (1986), 193 – 198.

[26] Rakočević, V., Operators obeying a-Weyl's theorem, *Rev. Roumaine Math. Pures Appl.* **34** (1989), 915 – 919.