VOLTERRA INTEGRAL OPERATOR FROM WEIGHTED BERGMAN SPACES TO GENERAL FUNCTION SPACES

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Abstract. The boundedness, compactness and essential norm of Volterra integral operator V_g from weighted Bergman spaces A_α^p to general function spaces $F(q, qt - 2, s)$ are investigated in this paper.

REFERENCES

[1] A. ALEMAN AND J. CIMA, *An integral operator on H^p and Hardy's inequality*, J. Anal. Math. **85** (2001), 157–176.

[2] A. ALEMAN AND A. SISKAKIS, *An integral operator on H^p*, Complex Var. Theory Appl. **28** (1955), 149–158.

[3] A. ALEMAN AND A. SISKAKIS, *Integration operators on Bergman spaces*, Indiana Univ. Math. J. **46** (1997), 337–356.

[4] D. C. CHANG, S. LI AND S. STEVIĆ, *On some integral operators on the unit polydisk and the unit ball*, Taiwanese J. Math. **11** (2007), 1251–1286.

[5] P. DUREN, *Theory of H^p Spaces*, Academic Press, New York, 1970.

[6] P. GALINDO, M. LINDSTRÖM AND S. STEVIĆ, *Essential norm of operators into weighted-type spaces on the unit ball*, Abstr. Appl. Anal. **2011** (2011), Article ID 939873, 13 pages.

[7] L. HU, R. YANG AND S. LI, *Dirichlet-Morrey type spaces and Volterra integral operators*, J. Nonlinear Var. Anal. **5** (2021), 477–491.

[8] J. LAITILA, S. MIIHKINEN AND J. NIEMINEN, *Essential norms and weak compactness of integration operators*, Archiv der Math. **85** (2011), 39–48.

[9] P. LI, J. LIU AND Z. LOU, *Integral operators on analytic Morrey spaces*, Sci. China Math. **57** (2014), 1–15.

[10] S. LI, J. LIU AND C. YUAN, *Embedding theorem for Dirichlet type spaces*, Canad. Math. Bull. **63** (2020), 106–17.

[11] S. LI AND S. STEVIĆ, *Compactness of Riemann-Stieltjes operators between $F(p,q,s)$ and α-Bloch spaces*, Publ. Math. Debrecen **72** (1–2) (2008), 111–128.

[12] D. LUECKING, *Embedding theorems for spaces of analytic functions via Khinchine's inequality*, Michigan Math. J. **40** (1993), 333–358.

[13] J. PAU AND R. ZHAO, *Carleson measures, Riemann-Stieltjes and multiplication operators on a general family of function spaces*, Integral Equations Operator Theory **78** (2014), 483–514.

[14] R. PENG, Y. WU AND F. DENG, *Carleson measures, Riemann-Stieltjes operators and multipliers on $F(p,q,s)$ spaces in the unit ball of $\mathbb{C}^n$*, Acta Math. Scientia **36** (2016), 635–654.

[15] R. PENG, X. XING AND L. JIANG, *Pointwise multiplication operators from Hardy spaces to weighted Bergman spaces in the unit ball of $\mathbb{C}^n$*, Acta Math. Scientia **39** (2019), 1003–1016.

[16] C. POMMERENKE, *Schlichte funktionen und analytische funktionen von beschränkter mittlerer oszillation*, Comm. Math. Helv. **52** (1977), 591–602.

[17] R. QIAN AND X. ZHU, *Embedding of Q_p spaces into tent spaces and Volterra integral operator*, AIMS Math. **6** (2021), 698–711.

[18] R. QIAN AND X. ZHU, *Embedding of Dirichlet type spaces into tent spaces and Volterra operators*, Canad. Math. Bull. **64** (2021), 697–708.

[19] B. SEHBA AND S. STEVIĆ, *On some product-type operators from Hardy-Orlicz and Bergman-Orlicz spaces to weighted-type spaces*, Appl. Math. Comput. **233** (2014), 565–581.

[20] C. SHEN AND S. LI, *Volterra integral operators from Dirichlet type spaces into Hardy spaces*, Ric. Mat., https://doi.org/10.1007/s11587-021-00603-2.

[21] C. SHEN, Z. LOU AND S. LI, *Embedding of BMOA_{log} into tent spaces and Volterra integral operators*, Comput. Methods Funct. Theory **20** (2020), 217–234.

[22] A. SISKAKIS AND R. ZHAO, *A Volterra type operator on spaces of analytic functions*, Contemp. Math. **232** (1999), 299–311.

[23] S. STEVIĆ, *On a new integral-type operator from the Bloch space to Bloch-type spaces on the unit ball*, J. Math. Anal. Appl. **354** (2009), 426–434.

[24] S. STEVIĆ, *Norm and essential norm of an integral-type operator from the Dirichlet space to the Bloch-type space on the unit ball*, Abstr. Appl. Anal. **2010** (2010), Article ID 134969, 9 pages.

[25] S. STEVIĆ, *On operator P_φ^g from the logarithmic Bloch-type space to the mixed-norm space on unit ball*, Appl. Math. Comput. **215** (2010), 4248–4255.

[26] S. STEVIĆ, *Essential norm of operators into weighted-type spaces on the unit ball*, Abstr. Appl. Anal. **2011** (2011), Article ID 939873, 13 pages.

[27] S. STEVIĆ, *On some integral-type operators between a general space and Bloch-type spaces*, Appl. Math. Comput. **218** (2011), 2600–2618.

[28] S. STEVIĆ, *Essential norm of some extensions of the generalized composition operators between kth weighted-type spaces*, J. Inequal. Appl. **2017** (2017), Article No. 220, 13 pages.

[29] S. STEVIĆ, *Norm and essential norm of an integral-type operator from the logarithmic Bloch space to the Bloch-type space on the unit ball*, Math. Meth. Appl. Sci. 2022; 1–11, doi:10.1002/mma.8487.

[30] S. STEVIĆ AND Z. JIANG, *Boundedness and essential norm of an integral-type operator on a Hilbert-Bergman-type spaces*, J. Inequal. Appl. **2019** (2019), Article No. 121, 27 pages.

[31] F. SUN AND H. WULAN, *Characterizations of Morrey type spaces*, Canad. Math. Bull. **65** (2022), 328–344.

[32] M. TJANI, *Compact composition operators on some Möbius invariant Banach spaces*, PhD dissertation, Michigan State University, 1996.

[33] X. WU AND Z. WU, *Volterra operator from Bergman spaces to Morrey spaces*, Eurasian Math. J. **4** (2013), 135–144.

[34] J. XIAO, *The Q_p Carleson measure problem*, Adv. Math. **217** (2008), 2075–2088.

[35] R. YANG AND X. ZHU, *Besov-Morrey spaces and Volterra integral operator*, Math. Inequal. Appl. **24** (2021), 857–871.

[36] R. ZHAO, *On a general family of function spaces*, Ann. Acad. Sci. Fenn. Math. Diss. No. **105** (1996), 56 pp.

[37] J. ZHOU AND X. ZHU, *Essential norm of a Volterra-type integral operator from Hardy spaces to some analytic function spaces*, J. Integral Equ. Appl. **28** (2016), 581–593.

[38] K. ZHU, *Bloch type spaces of analytic functions*, Rocky Mountain J. Math. **23** (1993), 1143–1177.

[39] K. ZHU, *Operator Theory in Function Spaces*, 2nd edn, American Mathematical Society, Providence (2007).

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