

WEIGHTED COMPOSITION OPERATORS FROM ZYGMUND TYPE SPACES INTO BLOCH TYPE SPACES

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Abstract. In this paper, we investigate the boundedness and compactness of weighted composition operators from Zygmund type spaces to Bloch type spaces.

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REFERENCES

- [1] B. CHOE, H. KOO AND W. SMITH, *Composition operators on small spaces*, Integral Equations Oper. Theory **56** (2006), 357–380.
- [2] D. CLAHANE AND S. STEVIĆ, *Norm equivalence and composition operators between Bloch/Lipschitz spaces of the unit ball*, J. Ineq. Appl. **2006**, Article ID 61018, (2006), 11 pages.
- [3] F. COLONNA, *New criteria for boundedness and compactness of weighted composition operators mapping into the Bloch space*, Cent. Eur. J. Math. **11** (2013), 55–73.
- [4] C. COWEN AND B. MACCLUER, *Composition Operators on Spaces of Analytic Functions*, CRC Press, Boca Raton, FL, 1995.
- [5] P. DUREN, *Theory of H^p Spaces*, Academic press, New York, 1970.
- [6] K. ESMAEILI AND M. LINDSTRÖM, *Weighted composition operators between Zygmund type spaces and their essential norms*, Integral Equations Oper. Theory **75** (2013), 473–490.
- [7] Z. HU AND S. WANG, *Composition operators on Bloch-type spaces*, Proc. Royal Soc. Edinburgh, **135** (2005), 1229–1239.
- [8] Q. HU AND S. YE, *Weighted composition operators on the Zygmund spaces*, Abstr. Appl. Anal. **2012** (2012), Art. ID 462482.
- [9] O. HYVÄRINEN AND M. LINDSTRÖM, *Estimates of essential norm of weighted composition operators between Bloch-type spaces*, J. Math. Anal. Appl. **393** (2012), 38–44.
- [10] H. LI AND X. FU, *A new characterization of generalized weighted composition operators from the Bloch space into the Zygmund space*, J. Funct. Spaces Appl. Vol. **2013**, Article ID 925901, 12 pages.
- [11] S. LI AND S. STEVIĆ, *Composition followed by differentiation between Bloch type spaces*, J. Comput. Anal. Appl. **9** (2) (2007), 195–206.
- [12] S. LI AND S. STEVIĆ, *Volterra type operators on Zygmund space*, J. Ineq. Appl. Vol. **2007**, Article ID 32124, (2007), 10 pages.
- [13] S. LI AND S. STEVIĆ, *Generalized composition operators on Zygmund spaces and Bloch type spaces*, J. Math. Anal. Appl. **338** (2008), 1282–1295.
- [14] S. LI AND S. STEVIĆ, *Products of Volterra type operator and composition operator from H^∞ and Bloch spaces to the Zygmund space*, J. Math. Anal. Appl. **345** (2008), 40–52.
- [15] S. LI AND S. STEVIĆ, *Weighted composition operators from Zygmund spaces into Bloch spaces*, Appl. Math. Comput. **206** (2008), 825–831.
- [16] S. LI AND S. STEVIĆ, *Integral-type operators from Bloch-type spaces to Zygmund-type spaces*, Appl. Math. Comput. **215** (2009), 464–473.
- [17] S. LI AND S. STEVIĆ, *On an integral-type operator from ω -Bloch spaces to μ -Zygmund spaces*, Appl. Math. Comput. **215** (2010), 4385–4391.

- [18] S. LI AND S. STEVIĆ, *Products of composition and differentiation operators from Zygmund spaces to Bloch spaces and Bers spaces*, Appl. Math. Comput. **217** (2010), 3144–3154.
- [19] B. MACCLUER AND R. ZHAO, *Essential norm of weighted composition operators between Bloch-type spaces*, Rocky Mountain J. Math. **33** (2003), 1437–1458.
- [20] K. MADIGAN AND A. MATHESON, *Compact composition operators on the Bloch space*, Trans. Amer. Math. Soc. **347** (1995), 2679–2687.
- [21] J. MANHAS AND R. ZHAO, *New estimates of essential norms of weighted composition operators between Bloch type spaces*, J. Math. Anal. Appl. **389** (2012), 32–47.
- [22] S. OHNO, K. STROETHOFF AND R. ZHAO, *Weighted composition operators between Bloch-type spaces*, Rocky Mountain J. Math. **33** (2003), 191–215.
- [23] A. SHIELDS AND D. WILLIAMS, *Bounded projections, duality, and multipliers in spaces of analytic functions*, Trans. Amer. Math. Soc. **162** (1971), 287–302.
- [24] S. STEVIĆ, *Composition operators from the Hardy space to the Zygmund-type space on the upper half-plane*, Abstr. Appl. Vol. **2009**, Article ID 161528, (2009), 8 pages.
- [25] S. STEVIĆ, *On an integral operator from the Zygmund space to the Bloch-type space on the unit ball*, Glasg. J. Math. **51** (2009), 275–287.
- [26] S. STEVIĆ, *Composition operators from the Hardy space to Zygmund-type spaces on the upper half-plane and the unit disk*, J. Comput. Anal. Appl. **12** (2010), 305–312.
- [27] S. STEVIĆ, *On an integral-type operator from Zygmund-type spaces to mixed-norm spaces on the unit ball*, Abstr. Appl. Anal. Vol. **2010**, Article ID 198608, (2010), 7 pages.
- [28] S. STEVIĆ, *Weighted differentiation composition operators from H^∞ and Bloch spaces to n -th weighted-type spaces on the unit disk*, Appl. Math. Comput. **216** (2010), 3634–3641.
- [29] S. STEVIĆ AND A. SHARMA, *Composition operators from weighted Bergman-Privalov spaces to Zygmund type spaces on the unit disk*, Ann. Polon. Math. **105** (2012), 77–86.
- [30] S. STEVIĆ, Z. ZHOU AND R. CHEN, *Weighted composition operators between Bloch type spaces in the polydisc*, Sb. Math. **201** (1–2) (2010), 289–319.
- [31] H. WULAN, D. ZHENG AND K. ZHU, *Compact composition operators on BMOA and the Bloch space*, Proc. Amer. Math. Soc. **137** (2009), 3861–3868.
- [32] X. ZHANG AND J. XIAO, *Weighted composition between μ -Bloch spaces on the unit ball*, Sci. China **48** (2005), 1349–1368.
- [33] R. ZHAO, *Essential norms of composition operators between Bloch type spaces*, Proc. Amer. Math. Soc. **138** (2010), 2537–2546.
- [34] K. ZHU, *Operator Theory in Function Spaces*, Marcel Dekker, New York and Basel, 1990.
- [35] X. ZHU, *Generalized weighted composition operators on Bloch-type spaces*, J. Ineq. Appl. **2015** (2015), 59–68.