

SMALL HANKEL OPERATORS ON DIRICHLET-TYPE SPACES AND APPLICATIONS

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Abstract. In this paper, we characterize the boundedness and compactness of small Hankel operators on Dirichlet-type spaces D_ρ .

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REFERENCES

- [1] A. ALEMAN, *Hilbert spaces of analytic functions between the Hardy space and the Dirichlet space*, Proc. Amer. Math. Soc. **115** (1992), 97–104.
- [2] N. ARCOZZI, R. ROCHBERG AND E. SAWYER, *Carleson measures for analytic Besov spaces*, Rev. Mat. Iberoamericana **18** (2002), 443–510.
- [3] G. BAO, Z. LOU, R. QIAN AND H. WULAN, *On multipliers of Dirichlet type spaces*, Complex Anal. Oper. Theory. doi: 10.1007/s11785-015-0444-0, in press.
- [4] D. BLASI AND J. PAU, *A characterization of Besov type spaces and applications on Hankel type operators*, Michigan Math. J. **56** (2008), 401–417.
- [5] C. C. COWEN AND B. D. MACCLUER, *Composition Operators on Spaces of Analytic Functions*, CRC Press, Boca Raton, FL, 1995.
- [6] P. DUREN, *Theory of H^p Spaces*, Academic Press, New York, 1970.
- [7] J. GARNETT, *Bounded Analytic Functions*, Academic Press, New York, 1981.
- [8] P. HU AND W. ZHANG, *Small Hankel operators on the Dirichlet-type spaces on the Unit ball of C^n* , Acta Math. Sin. Engl. Ser. **20** (2004), 261–272.
- [9] S. JANSON, *Generalizations of Lipschitz spaces and an application to Hardy spaces and bounded mean oscillation*, Duke Math. J. **47** (1980), 959–982.
- [10] R. KERMAN AND E. SAWYER, *Carleson measures and multipliers of Dirichlet-type spaces*, Trans. Amer. Math. Soc. **309** (1988), 87–98.
- [11] S. LI AND S. STEVIĆ, *Composition followed by differentiation between H^∞ and α -Bloch spaces*, Houston J. Math. **35** (2009), 327–340.
- [12] X. LIU, G. CHACÓN AND Z. LOU, *Characterizations of Dirichlet-type spaces*, Complex Anal. Oper. Theory **9** (2015), 1269–1286.
- [13] D. LUECKING, *Representation and duality in weighted spaces of analytic functions*, Indiana Univ. J. Math. **34** (1985), 319–336.
- [14] R. QIAN AND Y. SHI, *Inner function in Dirichlet type spaces*, J. Math. Anal. Appl. **421** (2015), 1844–1854.
- [15] R. ROCHBERG AND S. SEMMES, *A decomposition theorem for BMO and applications*, J. Funct. Anal. **67** (1986), 228–263.
- [16] R. ROCHBERG AND Z. WU, *A new characterization of Dirichlet type spaces and applications*, Illinois J. Math. **37** (1993), 101–122.
- [17] S. STEVIĆ, *On an integral-type operator from logarithmic Bloch-type and mixed-norm spaces to Bloch-type spaces*, Nonlinear Anal. Theory, Methods and Applications, **71** (2009), 6323–6342.
- [18] 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.

- [19] H. WULAN AND J. ZHOU, *Decomposition theorems for \mathcal{D}_K spaces and applications*, Forum Math. **26** (2014), 467–495.
- [20] K. ZHU, *Operator Theory in Function Spaces*, American Mathematical Society, Providence, RI, 2007.