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Weighted composition operators from H^∞ to the Bloch space on the polydisc. (English)

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Let $\mathbb{D}^n$ be the unit polydisc of $\mathbb{C}^n$, $\varphi = (\varphi_1, \ldots, \varphi_n)$ be a self-map of $\mathbb{D}^n$, and let ψ be holomorphic on $\mathbb{D}^n$. The main result of the present paper establishes that the weighted composition operator ψC_φ is bounded from $H^\infty(\mathbb{D}^n)$ to $\mathcal{B}(\mathbb{D}^n)$, i.e., from bounded functions to functions in the Bloch space, if and only if $\psi \in \mathcal{B}(\mathbb{D}^n)$ and

$$\sup_{z\in\mathbb{D}^n} |\psi(z)| \sum_{k,j=1}^{n} \left|\frac{\partial \varphi_j}{\partial z_k}(z)\right| \frac{1-|z_k|^2}{1-|\varphi_j(z)|^2} < \infty.$$

The corresponding compactness result replacing the supremum by "little oh" conditions is also shown.

Reviewer: Oscar Blasco (Valencia)

MSC:

47B33 Linear composition operators
46E15 Banach spaces of continuous, differentiable or analytic functions

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weighted composition operators; polydisc; bounded analytic functions; Bloch spaces

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References:

[1] R. M. Timoney, "Bloch functions in several complex variables. I," The Bulletin of the London Mathematical Society, vol. 12, no. 4, pp. 241-267, 1980. · Zbl 0416.32010 · doi:10.1112/blms/12.4.241

[2] S. Ohno, "Weighted composition operators between H\infty and the Bloch space," Taiwanese Journal of Mathematics, vol. 5, no. 3, pp. 555-563, 2001. · Zbl 0997.47025

[3] S. Li and S. Stević, "Weighted composition operator between H\infty and \alpha -Bloch spaces in the unit ball," to appear in Taiwanese Journal of Mathematics.

[4] J. Shi and L. Luo, "Composition operators on the Bloch space of several complex variables," Acta Mathematica Sinica, vol. 16, no. 1, pp. 85-98, 2000. · Zbl 0967.32007 · doi:10.1007/s101149900028

[5] S. Stević, "Composition operators between H\infty and a-Bloch spaces on the polydisc," Zeitschrift für Analysis und ihre Anwendungen, vol. 25, no. 4, pp. 457-466, 2006. · Zbl 1118.47015 · doi:10.4171/ZAA/1301

[6] Z. Zhou, "Composition operators on the Lipschitz space in polydiscs," Science in China. Series A, vol. 46, no. 1, pp. 33-38, 2003. · Zbl 1217.32002 · doi:10.1360/03ys9004

[7] Z. Zhou and J. Shi, "Compact composition operators on the Bloch space in polydiscs," Science in China. Series A, vol. 44, no. 3, pp. 286-291, 2001. · Zbl 1024.47010 · doi:10.1007/BF02878708

[8] C. C. Cowen and B. D. MacCluer, Composition Operators on Spaces of Analytic Functions, Studies in Advanced Mathematics, CRC Press, Boca Raton, Fla, USA, 1995. · Zbl 0873.47017

[9] S. Stević, "The generalized Libera transform on Hardy, Bergman and Bloch spaces on the unit polydisc," Zeitschrift für Analysis und ihre Anwendungen, vol. 22, no. 1, pp. 179-186, 2003. · Zbl 1046.47026 · doi:10.4171/ZAA/1138

[10] G. Benke and D.-C. Chang, "A note on weighted Bergman spaces and the Cesàro operator," Nagoya Mathematical Journal, vol. 159, pp. 25-43, 2000. · Zbl 0981.32001

[11] S. Stević, "Cesàro averaging operators," Mathematische Nachrichten, vol. 248-249, pp. 185-189, 2003. · Zbl 1024.47014 · doi:10.1002/mana.200310013

[12] S. Stević, "Hilbert operator on the polydisk," Bulletin of the Institute of Mathematics. Academia Sinica, vol. 31, no. 2, pp. 135-142, 2003. · Zbl 1088.47024

[13] W. Rudin, Function Theory in the Unit Ball of \Bbb Cn, vol. 241 of Grundlehren der mathematischen Wissenschaften, Springer, New York, NY, USA, 1980. · Zbl 0495.32001