

Stević, Stevo

Composition operators between H^∞ and α -Bloch spaces on the polydisc. (English)

Zbl 1118.47015

Z. Anal. Anwend. 25, No. 4, 457-466 (2006).

Let U^n be the unit polydisc of \mathbb{C}^n , $\alpha > 0$, and let $H^\infty(U^n)$ and $\mathcal{B}^\alpha(U^n)$ denote the space of holomorphic functions in the unit disc on U^n which are bounded and belong to α -Bloch space, i.e., $\sup_{|z_k| < 1} \sum_{k=1}^n (1 - |z_k|^2)^\alpha \left| \frac{\partial f}{\partial z_k}(z) \right| < \infty$, respectively. Given a holomorphic self-map on U^n , $\phi = (\phi_1, \dots, \phi_n)$, the author shows that for $\alpha \geq 1$ the composition operator $C_\phi : H^\infty(U^n) \rightarrow \mathcal{B}^\alpha(U^n)$, defined by $C_\phi(f) = f \circ \phi$, is compact if and only if for every $\varepsilon > 0$, there exists $0 < \delta < 1$ such that if $\text{dist}(\phi(z), \partial U^n) < \delta$, then

$$\sum_{k,l=1}^n \frac{(1 - |z_k|^2)^\alpha}{1 - |\phi_l(z)|^2} \left| \frac{\partial \phi_l}{\partial z_k}(z) \right| < \varepsilon.$$

He uses his result to produce noncompact composition operators from $H^\infty(U^n)$ to $\mathcal{B}^1(U^n)$.

Reviewer: Oscar Blasco (Valencia)

MSC:

47B33 Linear composition operators

47B38 Linear operators on function spaces (general)

Cited in 47 Documents

Keywords:

composition operators; Bloch type functions in the polydisc

Full Text: DOI

References:

- [1] G. Benke and Chang, D. C., A note on weighted Bergman spaces and the Cesàro operator. Nagoya Math. J. 159 (2000), 25 - 43. · Zbl 0981.32001
- [2] Stević, S., Cesàro averaging operators. Math. Nachr. 248-249 (2003), 185 - 189. · Zbl 1024.47014 · doi:10.1002/mana.200310013
- [3] Stević, S., Hilbert operator on the polydisk. Bull. Inst. Math. Acad. Sinica 31 (2003)(2), 135 - 142. · Zbl 1088.47024
- [4] Stević, S., The generalized Libera transform on Hardy, Bergman and Bloch spaces on the unit polydisc. Z. Anal. Anwendungen 22 (2003)(1), 179 - 186. · Zbl 1046.47026 · doi:10.4171/ZAA/1138
- [5] Zhu, K., The Bergman spaces, the Bloch spaces, and Gleason's problem. Trans. Amer. Math. Soc. 309 (1988)(1), 253 - 268. · Zbl 0657.32002 · doi:10.2307/2001168
- [6] Zhu, K., Duality and Hankel operators on the Bergman spaces of bounded symmetric domains. J. Funct. Anal. 81 (1988), 260 - 278. · Zbl 0669.47019 · doi:10.1016/0022-1236(88)90100-0
- [7] Zhou, Z. H. and Shi, J. H., Compact composition operators on the Bloch space in polydiscs. Sci. China Ser. A 44 (2001), 286 - 291. · Zbl 1024.47010 · doi:10.1007/BF02878708
- [8] Zhou, Z. H. and Shi, J. H., Composition operators on the Bloch space in polydiscs. Complex Variables 46 (2001)(1), 73 - 88. · Zbl 1026.47018
- [9] Zhou, Z. H. and Shi, J. H., Compactness of composition operators on the Bloch space in classical bounded symmetric domains. Michigan Math. J. 50 (2002)(2), 381 - 405. · Zbl 1044.47021 · doi:10.1307/mmj/1028575740

This reference list is based on information provided by the publisher or from digital mathematics libraries. Its items are heuristically matched to zbMATH identifiers and may contain data conversion errors. It attempts to reflect the references listed in the original paper as accurately as possible without claiming the completeness or perfect precision of the matching.