Li, Songxiao; **Stević, Stevo**

Composition followed by differentiation between Bloch type spaces. (English) Zbl 1132.47026

J. Comput. Anal. Appl. 9, No. 2, 195-205 (2007).

Let $\mathbb{D}$ be the open unit disk in the complex plane. An analytic function f on $\mathbb{D}$ is said to belong to α-Bloch space $\mathcal{B}^\alpha$ if $\|f\|_{\mathcal{B}_\alpha} := \sup_{z\in\mathbb{D}}(1-|z|^2)^\alpha|f'(z)| < \infty$. The little α-Bloch space $\mathcal{B}_0^\alpha$ is the subspace of $\mathcal{B}^\alpha$ consisting of all $f \in \mathcal{B}^\alpha$ for which $(1-|z|^2)^\alpha|f'(z)| \to 0$ as $|z| \to 1$. These spaces are Banach spaces. Given an analytic self-map φ of $\mathbb{D}$, let C_φ denote the composition operator defined by $C_\varphi f = f \circ \varphi$ for analytic functions f on $\mathbb{D}$. Also, let $D = \partial/\partial z$ be the complex differentiation operator. In this paper, the authors obtain characterizations for the boundedness and compactness of $DC_\varphi : \mathcal{B}^\alpha \to \mathcal{B}^\beta$. They also obtain a characterization for the compactness of $DC_\varphi : \mathcal{B}^\alpha \to \mathcal{B}_0^\beta$.

Reviewer: Boo Rim Choe (Seoul)

MSC:

47B38 Linear operators on function spaces (general)
30D45 Normal functions of one complex variable, normal families
30H05 Spaces of bounded analytic functions of one complex variable
47B33 Linear composition operators

Keywords:

composition operator; differentiation operator; Bloch type space; boundedness; compactness