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**Paul S. Bourdon\*** (bourdonp@wlu.edu), Department of Mathematics, Washington and Lee University, Lexington, VA 24450. *Invertible weighted composition operators.*

Let  $X$  be a set of analytic functions on the open unit disk  $\mathbb{D}$ , and let  $\varphi$  be an analytic function on  $\mathbb{D}$  such that  $\varphi(\mathbb{D}) \subseteq \mathbb{D}$  and  $f \mapsto f \circ \varphi$  takes  $X$  into itself. We present conditions on  $X$  ensuring that if  $f \mapsto f \circ \varphi$  is invertible on  $X$ , then  $\varphi$  is an automorphism of  $\mathbb{D}$ , and we derive a similar result for mappings of the form  $f \mapsto \psi \cdot (f \circ \varphi)$ , where  $\psi$  is some analytic function on  $\mathbb{D}$ . We obtain as corollaries of this purely function-theoretic work, new results concerning invertibility of composition operators and weighted composition operators on Banach spaces of analytic functions. For instance, our work permits us to completely characterize invertibility of composition operators and weighted composition operators on automorphism-invariant functional Banach spaces such as  $S^p$ , which consists functions on  $\mathbb{D}$  having derivatives in the Hardy space  $H^p(\mathbb{D})$ . We also show that if a composition operator  $f \mapsto f \circ \varphi$  or weighted composition operator  $f \mapsto \psi \cdot (f \circ \varphi)$  on any weighted Hardy space  $H^2(\beta)$  is invertible, then  $\varphi$  must be an automorphism of  $\mathbb{D}$ . (Received September 12, 2011)