

1086-32-2699

**Hidetaka Hamada**, Kyushu Sangyo University, **Gabriela Kohr**, Babeş-Bolyai University, and **Jerry R. Muir, Jr.\*** ([jerry.muir@scranton.edu](mailto:jerry.muir@scranton.edu)), Department of Mathematics, University of Scranton, Scranton, PA 18510. *Extensions of  $L^d$ -Loewner Chains to Higher Dimensions*.

Recently, there has been a great deal of research activity involving the theory of  $L^d$ -Loewner chains on the Euclidean unit ball  $\mathbb{B}_n$  of  $\mathbb{C}^n$ . For  $d \in [1, \infty]$ , these are families  $\{f_t\}_{t \geq 0}$  of biholomorphic mappings from  $\mathbb{B}_n$  into  $\mathbb{C}^n$  such that  $f_s(\mathbb{B}_n) \subseteq f_t(\mathbb{B}_n)$  for all  $t \geq s \geq 0$  and, for each compact set  $K \subseteq \mathbb{B}_n$  and  $T > 0$ , there is a nonnegative function  $\kappa = \kappa_{K,T} \in L^d([0, T])$  such that

$$\|f_t(z) - f_s(z)\| \leq \int_s^t \kappa(x) dx, \quad z \in K, \quad 0 \leq s \leq t \leq T.$$

Classical normalized Loewner chains, families  $\{f_t\}_{t \geq 0}$  of biholomorphic mappings satisfying  $f_t(0) = 0$ ,  $Df_t(0) = e^t I$  ( $I$  the identity operator), and  $f_s \prec f_t$  (subordination) for all  $t \geq s \geq 0$ , are all  $L^\infty$ -Loewner chains. Certain extension operators, such as those due to Roper and Suffridge, Pfaltzgraff and Suffridge, and the speaker, extend normalized Loewner chains from lower to higher dimensions, and, consequently, these operators preserve certain geometric properties of mappings, such as starlikeness of the range. We consider whether the same extension results hold for general  $L^d$ -Loewner chains. (Received September 25, 2012)