

LOEWNER CHAINS AND GENERALIZED
ALMOST STARLIKE MAPPINGS

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Abstract. In this paper, we introduce the notion of generalized almost starlikeness on the unit disc as well as on the unit ball B^n in \mathbb{C}^n , and we prove that this notion can be characterized in terms of Loewner chains. Finally, we use the theory of Loewner chains to deduce that certain classes of generalized Roper-Suffridge extension operators preserve generalized almost starlikeness.

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Key words. Loewner chain, Roper-Suffridge extension operator, spirallike function, starlike function, subordination, subordination chain, biholomorphic mapping.

REFERENCES

- [1] FENG, S.X., *Some classes of holomorphic mappings in several complex variables*, University of Science and Technology of China, Ph.D. Thesis, 2004.
- [2] GONG, S. and LIU, T.S., *On the Roper-Suffridge extension operator*, J. Anal. Math., **88** (2002), 397–404.
- [3] GONG, S. and LIU, T.S., *The generalized Roper-Suffridge extension operator*, J. Math. Anal. Appl., **284** (2003), 425–434.
- [4] GRAHAM, I., HAMADA, H., KOHR, G. and SUFFRIDGE, T., *Extension operators for locally univalent mappings*, Michigan Math. J., **50** (2002), 37–55.
- [5] GRAHAM, I. and KOHR, G., *Univalent mappings associated with the Roper-Suffridge extension operator*, J. Anal. Math., **81** (2000), 331–342.
- [6] GRAHAM, I. and KOHR, G., *Geometric function theory in one and higher dimension*, Marcel Dekker, New York, 2003.
- [7] GRAHAM, I., KOHR, G. and KOHR, M., *Loewner chains and the Roper-Suffridge extension operator*, J. Math. Anal. Appl., **247** (2000), 448–465.
- [8] GRAHAM, I., KOHR, G. and KOHR, M., *Loewner chains and parametric representation in several complex variables*, J. Math. Anal. Appl., **281** (2003), 425–438.
- [9] HAMADA, H. and KOHR, G., *Subordination chains and the growth theorem of spirallike mappings*, Mathematica, **42(65)** (2000), 153–161.
- [10] LIU, T.S. and XU, Q-H., *Loewner chains associated with the generalized Roper-Suffridge extension operator*, J. Math. Anal. Appl., **322** (2006), 107–120.
- [11] NECHITA, V. and BALAETI, M.C., *Loewner chains and almost starlike mappings of complex order λ* , Carpathian J. Math., **26** (2010), 146–157.
- [12] PFALTZGRAFF, J. A., *Subordination chains and univalence of holomorphic mappings in C^m* , Math. Ann., **210** (1974), 55–68.
- [13] POMERENKE, C., *Univalent functions*, Vandenhoeck Ruprecht, Göttingen, 1975.
- [14] POREDA, T., *On the univalent subordination chain of holomorphic mappings in Banach spaces*, Comment. Math., **28** (1989), 295–304.
- [15] ROPER, K. and SUFFRIDGE, T.J., *Convex mappings on the unit ball of C^n* , J. Anal. Math., **65** (1995), 333–347.

- [16] SUFFRIDGE, T.J., *Starlikeness, convexity and other geometric properties of holomorphic maps in higher dimensions*, Lecture Notes in Math., Springer-Verlag, New York, **599** (1976), 146–159.
- [17] ZHU, Y.C. and LIU, M.S., *The generalized Roper-Suffridge extension operator in Banach spaces (II)*, J. Math. Anal. Appl., **303** (2005), 530–544.
- [18] XU, Q-H. and LIU, T.S., *Loewner chains and a subclass of biholomorphic mappings*, J. Math. Anal. Appl. **334** (2007), 1096–1105.

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