

## SHARP COEFFICIENTS BOUNDS FOR CLASS OF ALMOST STARLIKE MAPPINGS OF ORDER $\alpha$ IN $\mathbb{C}^n$

LIANGPENG XIONG

**Abstract.** Let  $\Omega$  be the bounded starlike circular domain. In this paper, we obtain the sharp bounds for the Fekete-Szegö functional  $|A_3 - \mu A_2^2|$  of the class  $\mathcal{AS}_\alpha^*(\Omega)$  of almost starlike mappings of order  $\alpha$  in  $\mathbb{C}^n$  ( $n \geq 2$ ), where  $\mu \in \mathbb{R}$ , and  $A_2, A_3$  are the first two coefficients of the homogeneous expansion of mappings  $f \in \mathcal{AS}_\alpha^*(\Omega)$ . Our results can be regarded as the extensions of corresponding works from the case in one dimension to the case in higher dimensions.

*Mathematics subject classification (2010):* 32H02, 30C45.

*Keywords and phrases:* Almost starlike mappings, bounded starlike circular domain, complex  $n$ -dimensional space, sharp coefficients estimates.

## REFERENCES

- [1] Y. ABU MUHANNA, L. LI, AND S. PONNUSAMY, *Extremal problems on the class of convex functions of order  $-\frac{1}{2}$* , Arch. Math. (Basel), **103**(6) (2014), 461–471.
- [2] B. BHOWMIK, S. PONNUSAMY AND K.-J. WIRTHS, *On the Fekete and Szegö problem for concave univalent functions*, J. Math. Anal. Appl. **373** (2011), 432–438.
- [3] L. BIEBERBACH, *Über die Koeffizienten der einigen Potenzreihen welche eine schlichte Abbildung des Einheitskreises vermitteln*, S. B. Preuss. Akad. Wiss., 1916.
- [4] H. CARTAN, *Sur la possibilité d'étendre aux fonctions de plusieurs variables complexes la théorie des fonctions univalentes*, in: Montel P. (Ed.), *Lecons sur les Fonctions Univalentes ou Multivalentes*, Gauthier-Villars, Paris, 1933.
- [5] M. FEKETE, G. SZEGÖ, *Eine Bemerkung über ungerade schlichte Funktionen*, J. Lond. Math. Soc., **8**, (1933), 85–89.
- [6] I. GRAHAM, G. KOHR, *Geometric function theory in one and higher dimensions*, Marcel Dekker, New York (2003).
- [7] I. GRAHAM, H. HAMADA, T. HONDA, K. H. SHON, *Growth, distortion and coefficient bounds for Carathéodory families in  $\mathbb{C}^n$  and complex Banach spaces*, J. Math. Anal. Appl., **416**, (2014), 449–469.
- [8] S. GONG, *The Bieberbach Conjecture*, Amer. Math. Soc., International Press, Providence, RI, 1999.
- [9] W. KOEFP, *On the Fekete-Szegö problem for close-to-convex functions II*, Arch. Math. (Basel) **49**(5) (1987), 420–433.
- [10] S. KANAS, H. E. DARWISH, *Fekete-Szegö problem for starlike and convex functions of complex order*, Appl. Math. Lett., **23**, (2010), 777–782.
- [11] W. KOEFP, *On the Fekete-Szegö problem for close-to-convex functions*, Proc. Amer. Math. Soc., **101**, (1987), 89–95.
- [12] L. LI, S. PONNUSAMY AND J. QIAO, *Generalized Zalcman conjecture for convex functions of order  $\alpha$* , Acta Mathematica Hungarica **150**(1) (2016), 234–246.
- [13] L. LI, S. PONNUSAMY, *On the generalized Zalcman functional  $\lambda a_n^2 - a_{2n-1}$  in the close-to-convex family*, Proc. Amer. Math. Soc., **145**, (2017), 833–846.
- [14] H. LUO, Q. H. XU, *On the Fekete and Szegö inequality for the subclass of strongly starlike mappings of order  $\alpha$* , Results Math., **72**, (2017), 343–357.
- [15] T. S. LIU, G. B. REN, *The growth theorem for starlike mappings on the bounded starlike circular domain*, Chin. Ann. Math., **19B**, (1998), 401–408.

- [16] M.OBRADOVIĆ, S.PONNUSAMY, K.J.WIRTHS, *Coefficient characterizations and sections for some univalent functions*, Sib. Math. J., **54**(1), (2013), 679–696.
- [17] H.ORHAN, E.DENİZ, D.RĂDUCANU, *The Fekete-Szegö problem for subclasses of analytic functions defined by a differential operator related to conic domains*, Comput. Math. Appl., **59**, (2010), 283–295.
- [18] H.ORHAN, E.DENİZ, M.ÇAĞLAR, *The Fekete-Szegö problem for certain subclasses of analytic functions*, Demonstratio Mathematica, **XLV**, (2012), 835–846.
- [19] H. ORHAN, E.TOKLU, E.KADIOĞLU, *Second Hankel determinant for certain subclasses of bi-univalent functions involving Chebyshev polynomials*, Turk. J. Math., **42**, (2018), 1927–1940.
- [20] C.POMMERENKE, *Univalent Functions*, in: Studia Mathematica Mathematische Lehrbucher, Vandenhoeck and Ruprecht, 1975.
- [21] H.M.SRIVASTAVA, A.K.MISHRA, P.GOCHAYAT, *Certain subclasses of analytic and bi-univalent functions*, Appl. Math. Lett., **23**, (2010), 1188–1192.
- [22] H.M.SRIVASTAVA, S. GABOURY, F.GHANIM, *Initial coefficient estimates for some subclasses of  $m$ -Fold symmetric bi-univalent functions*, Acta. Math. Sci., **36B**, (2016), 863–871.
- [23] L.P.XIONG, X.D.FENG, J.L.ZHANG, *Fekete-szegö inequality for generalized subclasses of univalent functions*, J. Math. Inequal., **8**, (2014), 643–659.
- [24] Q. H. XU, T. S. LIU, *Biholomorphic mappings on bounded starlike circular domains*, J. Math. Anal. Appl., **366**, (2010), 153–163.
- [25] Q. H. XU, J. YOU, *Coefficient inequality for a subclass of biholomorphic mappings in several complex variables*, Complex Var. Elliptic., **63**, (2018), 1306–1321.
- [26] Q. H. XU, T. S. LIU, *On the Fekete and Szegö problem for the class of starlike mappings in several complex variables*, Abstr. Appl. Anal., **ID 807026**, (2014), 1–6.