

A NEWLY DEFINED SUBCLASS OF BI-UNIVALENT  
FUNCTIONS SATISFYING SUBORDINATE CONDITIONS

EMEKA PETER MAZI and TIMOTHY OPOOLA

**Abstract.** The purpose of our present paper is to introduce a newly defined subclass of bi-univalent functions satisfying subordinate conditions defined in the open unit disc. Coefficient estimates of  $|a_2|$  and  $|a_3|$  and the Fekete-Szegő problem for functions of this newly-defined class are established. The results of this work generalize some well known results.

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**Key words.** Bi-univalent function, coefficient bounds, Fekete-Szegő inequalities, pseudo-starlike function, Sakaguchi type function, subordination, Taylor-Maclaurin coefficients.

REFERENCES

- [1] Ş. Altınkaya and S. Yalçın, *Coefficient bounds for a subclass of bi-univalent functions*, TWMS J. Pure Appl. Math., **6** (2015), 180–185.
- [2] Ş. Altınkaya and S. Yalçın, *Coefficient estimates for two new subclasses of bi-univalent functions with respect to symmetric points*, J. Funct. Spaces, **2015**, Article 145242, 1–5.
- [3] R.M. Ali, S.K. Lee, V. Ravichandran and S. Supramaniam, *Coefficient estimates for bi-univalent Ma-Minda starlike and convex functions*, Appl. Math. Lett., **25** (2012), 344–351.
- [4] K.O. Babalola, *On  $\lambda$ -pseudo-starlike functions*, J. Class. Anal., **3** (2013), 137–147.
- [5] D.A. Brannan and T.S. Taha, *On some classes of bi-univalent functions*, Stud. Univ. Babeş-Bolyai Math., **31** (1986), 70–77.
- [6] P.L. Duren, *Univalent Functions*, Springer Verlag, New York, 1983.
- [7] B.A. Frasin, *Coefficient inequalities for certain classes of Sakaguchi type functions*, Int. J. Nonlinear Sci., **10** (2010), 206–211.
- [8] S. G. Hamidi and J. M. Jahangiri, *Faber polynomial coefficients of bi-subordinate functions*, C. R. Math. Acad. Sci. Paris, **354** (2016), 365–370.
- [9] S. Joshi, S. Joshi and H. Pawar, *On some subclasses of bi-univalent functions associated with pseudo-starlike functions*, J. Egyptian Math. Soc., **24** (2016), 522–525.
- [10] M. Lewin, *On a coefficient problem for bi-univalent functions*, Proc. Amer. Math. Soc., **18** (1967), 63–68.
- [11] E.P. Mazi and T.O. Opoola, *On some subclasses of bi-univalent functions associating pseudo-starlike functions with Sakaguchi type functions*, General Mathematics, **25** (2017), 85–95.
- [12] G. Murugusundaramoorthy, N. Magesh and V. Prameela, *Coefficient bounds for certain subclasses of bi-univalent functions*, Abstr. Appl. Anal., **2013**, Article 573017.

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- [13] S.O. Olatunji and P.T. Ajai, *On subclasses of bi-univalent functions of Bazilevic type involving linear and Salagean operator*, Internat. J. Pure Appl. Math., **92** (2014), 645–656.
- [14] S. Owa, T. Sekine and R. Yamakawa, *On Sakaguchi type functions*, Appl. Math. Comput., **187** (2007), 356–361.
- [15] K. Sakaguchi, *On a certain univalent mapping*, J. Math. Soc. Japan, **11** (1959), 72–75.
- [16] S. Sumer Eker and B. Şeker, *On  $\lambda$ -pseudo bi-starlike and  $\lambda$ -pseudo bi-convex functions with respect to symmetrical points*, Tbilisi Math. J., **11** (2018), 49–57.
- [17] H. M. Srivastava, A. K. Mishra and P. Gochhayat, *Certain subclasses of analytic and bi-univalent functions*, Appl. Math. Lett., **23** (2010), 1188–1192.
- [18] T.S. Taha, *Topics in Univalent Function Theory*, Ph.D. Thesis, University of London, 1981.
- [19] Q.-H. Xu, Y.-C. Gui and H. M. Srivastava, *Coefficient estimates for a certain subclass of analytic and bi-univalent functions*, Appl. Math. Lett., **25** (2012), 990–994.
- [20] Q.-H. Xu, H.-G. Xiao and H. M. Srivastava, *A certain general subclass of analytic and bi-univalent functions and associated coefficient estimate problems*, Appl. Math. Comput., **218** (2012), 11461–11465.
- [21] P. Zaprawa, *On the Fekete-Szego problem for classes of bi-univalent functions*, Bull. Belg. Math. Soc. Simon Stevin, **21** (2014), 167–178.
- [22] A. Zireh, S. Hajiparvaneh and S. Bulut, *Faber polynomial coefficient estimates for a comprehensive subclass of analytic bi-univalent functions defined by subordination*, Bull. Belg. Math. Soc. Simon Stevin, **23** (2016), 487–504.

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*University of Ilorin*  
*Department of Mathematics*  
*Ilorin, Nigeria*  
*E-mail: emekmazi21@gmail.com*  
*E-mail: Opoola\_stc@yahoo.com*