

FURTHER INVESTIGATIONS ON SOME RESULTS OF YU

ABHIJIT BANERJEE AND MOLLA BASIR AHAMED

Abstract. With the help of weighted sharing of values, we investigate the uniqueness of rational function of a meromorphic functions sharing a small function with its differential polynomial. Our results will extend and improve a number of result in the direction of Yu [18]. Specifically we stress on the improvement of two recent results of Charak and Lal [8] and Li, Yang and Liu [14]. We have exhibited several examples to justify our certain claims.

Mathematics subject classification (2010): 30D35.

Keywords and phrases: Meromorphic function, derivative, small function, weighted sharing.

REFERENCES

- [1] T. C. ALZAHARY AND H. X. YI, *Weighted value sharing and a question of I. Lahiri*, Complex Var. Theory Appl. **49**: 15 (2004), 1063–1078.
- [2] A. BANERJEE AND M. B. AHAMED, *Meromorphic function sharing a small function with its differential polynomial*, Acta Univ. Palacki. Olomuc., Fac. rer. nat., Mathematica, **54**, 1 (2015), 33–45.
- [3] A. BANERJEE AND M. B. AHAMED, *Uniqueness of a polynomial and a differential monomial sharing a small function*, Analele Universitatii de Vest, Timisoara Seria Mathematica – Informatica, **54**: 1 (2016), 55–71.
- [4] A. BANERJEE AND B. CHAKRABORTY, *Further investigations on a question of Zhang and Lü*, Ann. Univ. Paedagog. Crac. Stud. Math. **14** (2015), 105–119.
- [5] S. BHOOSNURMATH AND S. R. KABBUR, *On entire and meromorphic functions that share one small function with their differential polynomial*, Hindawi Publishing Corporation, Intl. J. Analysis (2013), Article ID 926340.
- [6] R. BRÜCK, *On entire functions which share one value CM with their first derivative*, Results Math. **30** (1996), 21–24.
- [7] K. S. CHARAK AND B. LAL, *Uniqueness of $p(f)$ and $P[f]$* , Turkish J. Math., **40** (2016), 569–581.
- [8] C. T. CHUANG, *On differential polynomials, Analysis of one complex variable* (Laramie, Wyo., 1985) 12–32, World Sci. Publishing Singapore 1987.
- [9] G. G. GUNDERSEN AND L. Z. YANG, *Entire functions that share one value with one or two of their derivatives*, J. Math. Anal. Appl. **223**: 1 (1998), 88–95.
- [10] W. K. HAYMAN, *Meromorphic Functions*, The Clarendon Press, Oxford (1964).
- [11] I. LAHIRI, *Weighted sharing and uniqueness of meromorphic functions*, Nagoya Math. J. **161** (2001), 193–206.
- [12] I. LAHIRI, *Weighted value sharing and uniqueness of meromorphic functions*, Complex Var. Theory Appl. **46** (2001), 241–253.
- [13] I. LAHIRI AND A. SARKAR, *Uniqueness of meromorphic function and its derivative*, J. Inequal. Pure Appl. Math. **5**: 1 (2004), Art. 20, <http://jipam.vu.edu.au/>.
- [14] N. LI, L. YANG AND K. LIU, *A further result related to a conjecture of R. Brück*, Kyungpook Math. J. **56** (2016), 451–464.
- [15] A. Z. MOHON'KO, *On the Nevanlinna characteristics of some meromorphic functions*, Theory of Functions. Functional Analysis and Their Applications **14** (1971), 83–87.
- [16] L. Z. YANG, *Solution of a differential equation and its applications*, Kodai Math. J. **22** (1999), 458–464.
- [17] H. X. YI, *On characteristic function of a meromorphic function and its derivative*, Indian J. Math. **33**: 2 (1991), 119–133.

- [18] K. W. YU, *On entire and meromorphic functions that share small functions with their derivatives*, J. Inequal. Pure Appl. Math. **4**: 1 (2003), Art. 21, <http://jipam.vu.edu.au/>.
- [19] Q. C. ZHANG, *The uniqueness of meromorphic functions with their derivatives*, Kodai Math. J. **21** (1998), 179–184.
- [20] Q. C. ZHANG, *Meromorphic function that shares one small function with its derivative*, J. Inequal. Pure Appl. Math. **6**: 4 (2005), Art. 116, <http://jipam.vu.edu.au/>.
- [21] T. D. ZHANG AND W. R. LÜ, *Notes on meromorphic function sharing one small function with its derivative*, Complex Var. Ellip. Eqn. **53**: 9 (2008), 857–867.