

## CERTAIN NON-LINEAR DIFFERENTIAL POLYNOMIALS HAVING COMMON POLES SHARING A NON ZERO POLYNOMIAL WITH FINITE WEIGHT

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*Abstract.* With the notion of weighted sharing we study the uniqueness property of meromorphic functions having common poles when certain non-linear differential polynomials share a non zero polynomial function. Our theorems in the paper will improve, extend and supplement a number of recent results in a more compact and convenient way.

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### 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, *Meromorphic functions sharing one value*, Int. J. Math. Math. Sci., **22**, (2005), 3587–3598.
- [3] A. BANERJEE, *On a question of Gross*, J.Math.Anal.Appl., **327**, 2 (2007), 1273–1283.
- [4] M.L. FANG AND H.L. QIU, *Meromorphic functions that share fixed points*, J. Math. Anal. Appl., **268**, (2002), 426–439.
- [5] W. K. HAYMAN, *Picard values of meromorphic Functions and their derivatives*, Ann. Math., **70**, (1959), 9–42.
- [6] W. K. HAYMAN, *Meromorphic Functions*, The Clarendon Press, Oxford (1964).
- [7] I. LAHIRI, *Value distribution of certain differential polynomials*, Int. J. Math. Math. Sci., **28**, (2001), 83–91.
- [8] I.LAHIRI, *Weighted sharing and uniqueness of meromorphic functions*, Nagoya Math. J., **161**, (2001), 193–206.
- [9] I.LAHIRI, *Weighted value sharing and uniqueness of meromorphic functions*, Complex Var. Theory Appl., **46** (2001), 241–253.
- [10] I.LAHIRI, *On a question of Hong Xun Yi*, Arch. Math. (Brno), **38**, (2002), 119–128.
- [11] P. LI AND C. C. YANG, *On the characteristics of meromorphic functions that share three values CM*, J. Math. Anal. Appl., **220**, (1998), 132–145.
- [12] X.Q.LIN, *Further results on uniqueness of entire functions sharing one value*, Rend. Sem. Mat. Univ. Politec. Torino, **69**, 1 (2011), 37–49.
- [13] L.Q.WANG AND X.D.LUO, *Uniqueness of meromorphic functions concerning fixed points*, Math. Slovaca, **62**, 1 (2012), 29–38.
- [14] J. WANG, W. LU AND Y. CHEN, *Value sharing of meromorphic functions and their derivatives*, Appl. Math. E-Notes, **11**, (2011), 91–100.
- [15] J.F.XU, F. LU AND H.X. YI, *Fixed points and uniqueness of meromorphic functions*, Comput. Math. Appl., **59**, (2010), 9–17.
- [16] C.C.YANG, *On deficiencies of differential polynomials II*, Math. Z. Vol. **125**, (1972), 107–112.
- [17] C.C.YANG AND X.H.HUA, *Uniqueness and value sharing of meromorphic functions*, Ann.Acad. Sci. Fenn. Math., **22**, (1997), 395–406.
- [18] H.X.YI, *On characteristic function of a meromorphic function and its derivative*, INDIAN J. MATH., **33**, 2 (1991), 119–133.

- [19] H. X. YI, *Meromorphic functions that share one or two values II*, Kodai Math. J., **22**, (1999), 264–272.
- [20] Q. C. ZHANG, *Meromorphic function that shares one small function with its derivative*, J.Inequal. Pure Appl. Math., **6**, 4(2005), Art.116 [ ONLINE <http://jipam.vu.edu.au/>].
- [21] X. Y. ZHANG AND W. C. LIN, *Uniqueness and value sharing of entire functions*, J.Math. Anal. Appl., **343**, (2008), 938–950.
- [22] X. Y. ZHANG AND W. C. LIN, *Corrigendum to “Uniqueness and value sharing of entire functions”* (J.Math. Anal. Appl., **343**, (2008), 938–950), J.Math. Anal. Appl., 352(2009), 971.