

## NEVANLINNA'S FIVE-VALUE THEOREM FOR DERIVATIVES OF MEROMORPHIC FUNCTIONS IN AN ANGULAR DOMAIN

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*Abstract.* In this paper, we first obtain the famous Xiong Inequality for meromorphic functions in an angular domain and also generalise Nevanlinna's five-value theorem for derivatives of meromorphic functions by considering weaker assumptions of sharing five values and small functions to partially sharing  $k(\geq 5)$  values and small functions in an angular domain. As a particular cases of our results, we deduce He Ping result in an angular domain.

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### REFERENCES

- [1] S. S. BHOOSNURMATH, R. S. DYAVANAL, M. BARKI, A. RATHOD, *Value distribution for  $n$ 'th difference operator of meromorphic functions with maximal deficiency sum*, J. Anal., **27**, (2019), 797–811.
- [2] S. DAOCHUN, G. ZONGSHENG, *Value distribution theory of algebroid functions*, Beijing, Science Press, 2014.
- [3] A. A. GOL'DBERG, I. V. OSTROVSKII, *The distribution of values of meromorphic function*, Nauka, Moscow, 1970.
- [4] G. G. GUNDERSON, *Meromorphic functions that share three or four values*, London Math. Soc., **20**, (1979), 457–466.
- [5] W. K. HAYMAN, *Meromorphic functions*, Oxford, Oxford University Press, 1964.
- [6] Y. HONGXUN, *On the multiple values and uniqueness of algebroid functions*, Eng. Math., (1991), **8**, 1–8.
- [7] H. PING, *Uniqueness of meromorphic functions sharing values*, An. St. Univ. Ovidius Constanta, **18** (2), (2010), 209–216.
- [8] A. RATHOD, *The multiple values of algebroid functions and uniqueness*, Asian J. Math. Comp. Res., **14** (2), (2016), 150–157.
- [9] A. RATHOD, *Several uniqueness theorems for algebroid functions*, J. Anal., doi:10.1007/s41478-0041-x.
- [10] A. RATHOD, *The multiple values of algebroid functions and uniqueness on annuli*, Konuralp Journal of Mathematics, **5**, (2017), 216–227.
- [11] A. RATHOD, *Nevanlinna's five-value theorem for algebroid functions*, Ufa Math. J. **10**, (2018), 127–132.
- [12] A. RATHOD, *Nevanlinna's five-value theorem for derivatives of algebroid functions on annuli*, Tamkang J. Math., **49**, (2018), 129–142.
- [13] A. RATHOD, *Characteristic function and deficiency of algebroid functions on annuli*, Ufa Mathematical J., **11**, (2019), 121–132.
- [14] A. RATHOD, *Value distribution of a algebroid function and its linear combination of derivatives on annuli*, Electronic J. Math. Analysis appl., **8**, (2020), 129–142.
- [15] A. RATHOD, *Uniqueness theorems for meromorphic functions on annuli*, Ufa Mathematical J., **12**, (2020), 115–121.

- [16] A. RATHOD, *Exceptional values of algebroid functions on annuli*, J. Anal., (2020), <https://doi.org/10.1007/s41478-020-00251-z>.
- [17] A. RATHOD, S. H. NAVEENKUMAR, *On the uniqueness and value distribution of entire functions with their derivatives*, Math. Combin. Book Ser., **2**, (2020), 33–42.
- [18] A. RATHOD, S. H. NAVEENKUMAR, *Uniqueness of algebroid functions in connection to Nevanlinna's five-value theorem*, Jnanabha, **50** (2), (2020), 160–166.
- [19] A. RATHOD, *The shared set and uniqueness of meromorphic functions in an angular domain*, Tbilisi Math. J., **14** (3), (2021), 95–109.
- [20] A. RATHOD, *Uniqueness and value sharing of meromorphic functions on annuli*, Malaya J. Matematik, **9** (1), (2021), 1071–1079.
- [21] A. RATHOD, *The shared set and uniqueness of algebroid functions on annuli*, Malaya J. Matematik, **9** (1), (2021), 1047–1056.
- [22] H. YU-ZAN, X. XIU-ZHI, *Algebroid functions and Ordinary Difference Equations*, Beijing, Science Press, 1988.
- [23] Q. C. ZHANG, *Meromorphic functions sharing values in an angular domain*, Math. Anal. Appl., **47**, (2009), 100–112.
- [24] Z. H. ZHENG, *On the uniqueness of meromorphic functions with shared values in some angular domains*, Math. Anal. Appl., **47**, (2009), 100–112.