

SOME RESULTS ON SUM AND PRODUCT OF RELATIVE GROWTH FACTORS OF COMPOSITE ENTIRE FUNCTIONS

SANJIB KUMAR DATTA, BANANI DUTTA AND NITYAGOPAL BISWAS

Abstract. In this paper we study about the sum and product of relative $(p,q,t)L$ -th type and relative $(p,q,t)L$ -th lower type of an entire function with respect to another entire function in the light of a special type of non-decreasing, unbounded function Ψ .

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REFERENCES

- [1] R. P. AGARWAL, S. K. DATTA, T. BISWAS AND P. SAHOO, *On the growth analysis of iterated entire functions*, Advanced Studies in Contemporary Mathematics., **26**, 1 (2016), 93–137.
- [2] L. BERNAL, *Orden relativ de crecimiento de funciones enteras*, Collect Mth., **46**, 1 (1917), 157–159.
- [3] T. BISWAS, *Some results relating to sum and product theorems of relative $(p,q,t)L$ -th order and relative $(p,q,t)L$ -th type of entire functions*, Korean J. Math., **26**, 2 (2018), 215–269.
- [4] I. CHYZHYKOV, J. HEITTOKANGAS AND J. RÄTTYÄ, *Finiteness of φ -order of solutions of linear differential equations in the unit disc*, J. Anal. Math., (2009), 109: 209–229, 10.1007/s11854-009-0030-3.
- [5] S. K. DATTA, T. BISWAS AND C. GHOSH, *On relative (p,q) -th order based growth measure of entire functions*, Filomat, **30**, 7 (2016), 1723–1735.
- [6] S. K. DATTA, T. BISWAS AND D. DUTTA, *Generalized relative type and generalized weak type of entire functions*, Journal of Complex Analysis, (2016), Article ID 3468354, 11 pages.
- [7] W. K. HAYMAN, *Meromorphic functions*, The Calendron Press, (1946).
- [8] O. P. JUNEJA, G. P. KAPOOR AND S. K. BAJPAI, *On the (p,q) -order and lower (p,q) -order of an entire function*, J. Reine Angew. Math., **282** (1976), 53–67.
- [9] O. P. JUNEJA, G. P. KAPOOR AND S. K. BAJPAI, *On the (p,q) -type and lower (p,q) -type of an entire function*, J. Reine Angew. Math., **290** (1977), 180–190.
- [10] L. M. SANCHEZ RUIZ, S. K. DATTA, T. BISWAS AND G. K. MANDAL, *On the (p,q) -th relative order and oriented growth properties of entire functions*, Abstr. Appl. Anal., (2014), Article ID 826137, 8 pages, <http://dx.doi.org/10.1155/2014/826137>.
- [11] H. M. SRIVASTAVA, S. K. DATTA, T. BISWAS AND D. DUTTA, *Sum and product theorems depending on the (p,q) -th order and (p,q) -th type of entire functions*, Cogent Mathematics, (2015), 2 : 1107951, 1–22.
- [12] X. SHEN, J. TU AND H. Y. XU, *Complex oscillation of a second order linear differential equation with entire coefficients of $[p,q]$ - φ ' order*, Advances in Difference Equations, (2014), 2014 : 200.
- [13] D. SOMASUNDARAM AND R. THAMIZHARASI, *A note on the entire functions of L -bounded index and L -type*, Indian J. Pure. Appl. Math., **19**, 3 (1988), 284–293.
- [14] G. VALIRON, *Lectures on the general theory of Integral functions*, Chelsea Publishing Company, (1949).