

Value distribution theory of shifts of meromorphic functions

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Ablowitz, Halburd and Herbst first pointed out the importance of the Nevanlinna theory in considerations related to discrete Painlevé equations. Their work has then been continued by Halburd, Korhonen and Ronkainen.

In the first part of the talk, we briefly describe the Nevanlinna theory for differences of meromorphic functions, as developed by Halburd and Korhonen. In addition, we sketch the proof of a difference analogue of the classical Clunie lemma.

In the second part (based on a recent paper by the speaker and his former students), we describe what is known about value sharing of meromorphic functions and their shifts. At the same time, these results describe sufficient conditions for periodicity. As an example: Suppose f is meromorphic of finite order, $c \in \mathbb{C}$ and a_1, a_2, a_3 are small distinct periodic functions with period c . If $f(z), f(z+c)$ share a_1, a_2 counting multiplicity and a_3 ignoring multiplicity, then f is periodic with period c . Our final comments concern value sharing of $f, f \circ p$ for f meromorphic and p entire.