



复旦大学数学科学学院 数学综合报告会

报告题目: Delay Differential Equations and Nevanlinna theory

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地点: 光华东主楼1513

报告摘要:

One way in which difference Painlevé equations arise is in the study of difference equations admitting meromorphic solutions of slow growth in the sense of Nevanlinna theory. The idea that the existence of sufficiently many finite-order meromorphic solutions could be considered as a version of the Painlevé property for difference equations was introduced by Ablowitz, Halburd and Herbst [1]. In this talk necessary conditions are obtained for certain types of rational delay differential equations to admit a transcendental meromorphic solution of hyper-order less than one. The equations obtained include delay Painlevé equations and equations solved by elliptic functions [2]. In addition, we present some recent results on the existence of transcendental meromorphic solutions of first-order difference equations, without growth conditions [3, 4].

References

- [1] M. J. Ablowitz, R. Halburd, B. Herbst, *On the extension of the Painlevé property to difference equations*, *Nonlinearity* **13** (2000), 889–905.
- [2] R. G. Halburd, R. J. Korhonen, *Growth of meromorphic solutions of delay differential equations*, *Proc. Amer. Math. Soc.* **145** (2017), 2513–2526.
- [3] R. Korhonen, Y. Zhang, *Existence of meromorphic solutions of first-order difference equations*, *Constr. Approx.* **51** (2020), 465–504.
- [4] Y. Zhang, R. Korhonen, *A Malmquist-Steinmetz theorem for difference equations*, *Constr. Approx.* **59** (2024), 619–673.

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