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The mixed Ax-Lindemann theorem and its applications to the Zilber-Pink conjecture

The Zilber-Pink conjecture is a diophantine conjecture concerning unlikely intersections in mixed Shimura varieties. It is a common generalization of the Mordell-Lang conjecture and the Andre-Oort conjecture. Following the Pila-Zannier method, recent development has been made about this conjecture by Pila, Pila-Tsimerman, Ullmo-Yafaev, Klingler-Ullmo-Yafaev, Gao in the direction of Andre-Oort conjecture and by Habegger-Pila, Orr in the direction of unlikely intersections beyond Andre-Oort. In all the proofs, a key point is to prove the Ax-Lindemann theorem (or more generally the Ax-Schanuel theorem), which is a generalization of the classical Lindemann-Weierstrass theorem in the functional case. In this talk, I will explain how to view the Ax-Lindemann theorem as a bi-algebraic statement and how it is a natural generalization of the classical Lindemann-Weierstrass theorem. Then I will discuss about its application to some special cases of the Zilber-Pink conjecture, in particular the Andre-Oort conjecture. I will focus on the universal family of abelian varieties in my talk.