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Waterloo, ON N2L3G1, Canada. *Simultaneous solutions of independent Mahler equations.*

A power series $F(x)$ is said to satisfy a k -Mahler difference equation, for a natural number $k \geq 2$, if it is the solution to a non-trivial homogeneous linear difference equation with polynomial coefficients of the form

$$\sum_{i=0}^d p_i(x) F(x^{k^i}) = 0.$$

Loxton and van der Poorten asked whether a function satisfying a k -Mahler and l -Mahler difference equation for two multiplicatively independent natural number k and l is necessarily rational. We show that this is indeed the case and we raise some questions with a view towards the goal of proving hypertranscendence of irrational solutions to Mahler difference equations. This is joint work with Boris Adamczewski. (Received January 28, 2019)