

Javad Mashreghi and Thomas Ransford, **Using entire functions to analyse power growth**, *Proceedings of Banach Algebras and Their Applications*, (Eds. T. Lau, V. Runde), Contemporary Math. 263, 235–240, American Mathematical Society, Providence RI, 2004.

Abstract

We illustrate a technique from the theory of entire functions by proving the following variant of a result of Allan about power growth in Banach algebras. Let a be an element of a unital Banach algebra, let $m \in \mathbf{Z}^+$ and let $\alpha \in (0, 1)$. Then

$$\|a^m((1+a)^n - (1-a)^n)\| = O(e^{\epsilon n^\alpha}) \quad (n \rightarrow \infty)$$

for all $\epsilon > 0$ if and only if $\lim_{n \rightarrow \infty} n^{1/\alpha-1} \|a^n\|^{1/n} = 0$.