

1068-52-134

Chun-Kit Lai* (cklai@math.cuhk.edu.hk), Department of Mathematics, The Chinese University of Hong Kong, Hong Kong, and **Ka-Sing Lau** and **Hui Rao**. *On structure of digit sets of self-similar tiles on \mathbb{R}^1 .*

We study the structure of the digit sets \mathcal{D} for the integral self-similar tiles $T(b, \mathcal{D})$. By investigating the the zeros of mask polynomial of \mathcal{D} on the unit circle, we characterize the tile digit sets through some product of cyclotomic polynomials via a graph representation. We then show that all tile digit sets in any dimension are indeed integer tiles. Using this relationship, we explicitly classify the tile digit sets for $b = p^\alpha q$ in terms of the higher order modulo product-forms, which generalize previously known cases in literature. (Received January 16, 2011)