Long sets of lengths with maximal elasticity
Alfred Geroldinger and Qinghai Zhong

Abstract. We introduce a new invariant describing the structure of sets of lengths in atomic monoids and domains. For an atomic monoid $H$, let $\Delta_{\rho}(H)$ be the set of all positive integers $d$ which occur as differences of arbitrarily long arithmetical progressions contained in sets of lengths having maximal elasticity $\rho(H)$. We study $\Delta_{\rho}(H)$ for transfer Krull monoids of finite type (including commutative Krull domains with finite class group) with methods from additive combinatorics, and also for a class of weakly Krull domains (including orders in algebraic number fields) for which we use ideal theoretic methods.