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**Harold Polo\***, Department of Mathematics, University of Florida, P.O. Box 118105, Gainesville, FL 32611. *On the sets of lengths of Puiseux monoids generated by multiple geometric sequences.*

It is well known that a Puiseux monoid  $M$  is atomic if and only if  $M$  contains a minimal set of generators. This characterization, whose verification involves a great deal of effort given that Puiseux monoids are not, in general, finitely generated, motivated a series of papers studying the atomicity of Puiseux monoids generated by structured sets such as monotone and geometric sequences. In this paper, we focus on the study of rational multicyclic monoids, that is, Puiseux monoids generated by multiple geometric sequences. In particular, we provide a complete description of the rational multicyclic monoids that are hereditarily atomic. Additionally, we show that the sets of lengths of certain family of atomic rational multicyclic monoids are finite unions of infinite multidimensional arithmetical progressions, a result we use to realize infinite arithmetic progressions as delta sets of some Puiseux monoids. (Received February 01, 2020)