

1163-13-124

Nicholas R Baeth* (nicholas.baeth@fandm.edu) and **Daniel Smertnig**
(daniel@smertnig.at). *Monoids of modules over Bass rings.*

Direct-sum decompositions of modules over a ring can often be modeled by the arithmetic of the monoid of their isomorphism classes, with operation induced by the direct sum. We present two models for studying direct-sum decompositions of finitely generated torsion-free modules over Bass rings — one-dimensional reduced noetherian rings with module-finite integral closure and where every ideal is 2-generated. Using results of Levy-Wiegand and Levy-Odenthall, we show that when the ring is semilocal, the monoid is isomorphic to a diophantine monoid. In the case when the ring is not semilocal, we find a transfer homomorphism to a diophantine monoid. A second model provides more insight into the arithmetic of this monoid. To a ring R we associate the graph \mathcal{G}_R of *prime ideal intersections* with vertices the minimal prime ideals of R and with an edge between two minimal primes \mathfrak{p} and \mathfrak{q} for each maximal ideal containing both of them. The *monoid of agglomerations* on \mathcal{G}_R is an additive monoid on the set of all possible labelings of \mathcal{G}_R such that each edge label is at most the labels of its adjacent vertices. We show that there is a transfer homomorphism to the monoid of agglomerations on \mathcal{G}_R . (Received August 18, 2020)