

1084-13-84

**Nicholas R Baeth\*** (baeth@ucmo.edu) and **Alfred Geroldinger**. *Arithmetic of Monoids of Modules over Two-dimensional Rings*. Preliminary report.

Let  $(R, \mathfrak{m})$  denote a two-dimensional normal domain such that its  $\mathfrak{m}$ -adic completion  $\hat{R}$  is also a normal domain. Given the ideal class groups of  $R$  and  $\hat{R}$  as well as the ideal classes represented by indecomposable torsion-free  $\hat{R}$ -modules, one can completely determine the monoid of isomorphism classes of torsion-free  $R$ -modules with operation given by direct sum. We will demonstrate this fact and then use well-known arithmetical invariants of commutative monoids to describe the uniqueness or non-uniqueness of direct-sum decompositions of torsion-free  $R$ -modules. (Received August 23, 2012)