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Methods for Classifying the Tor Algebra Structure for Trivariate Monomial Ideals. Preliminary report.

We will discuss methods that can be used to classify the Tor algebra structure for R/I , where $R = \mathbb{k}[x, y, z]$ and I is a monomial ideal primary to the homogeneous maximal ideal \mathfrak{m} of R such that $I \subseteq \mathfrak{m}^2$. Our classification is based off of recent work by L. Avramov where he classified the behavior of Bass numbers of embedding codepth 3 commutative local rings. His classification relied on a corresponding classification of their respective Tor algebras, which is comprised of five categories. We will see how we can use a graphical representation of the minimal free resolution of R/I along with some special properties of minimal resolutions for trivariate monomial ideals to classify the Tor algebra structure for R/I . In addition we will give a general classification of the Tor algebra structure for a special type of trivariate monomial ideals and discuss new examples in one of the five categories. (Received September 07, 2012)