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Jared L Painter* (jpainter@hbu.edu), 7502 Fondren Rd, Houston, TX 77074. *Interactions Between Free Resolutions, Bass Numbers, and Tor-Algebra Structures for Monomial Ideals*. Preliminary report.

We will discuss properties of the the minimal free resolution for R/I where $R = \mathbb{k}[x, y, z]$ and $I \subseteq \mathfrak{m}^2$ is an \mathfrak{m} -primary monomial ideal. We will also see how we can use properties of the resolution to describe the lower Bass numbers and the Tor-algebra structure for R/I . To achieve this we use recent work of L. Avramov, where he classifies the behavior of Bass numbers of embedding codepth 3 commutative local rings. His classification relies on a corresponding classification of their respective Tor algebras, which is comprised of 5 categories. Using Avramov's classification of the Tor algebra structures, along with their respective Bass series we will learn how to identify Tor algebra structure and lower Bass numbers for R/I by simply inspecting the minimal free resolution of R/I . In addition we will describe a class of ideals with a specific Tor-Algebra structure which was previously unknown. (Received August 22, 2012)