1067-15-54   **William R Henderson*** (`henderwr@dukes.jmu.edu`), **Jeffrey M Wyman**
(`wymanjm@dukes.jmu.edu`), **Carla D Martin** (`martincd@jmu.edu`) and **Misha E Kilmer**
(`misha.kilmer@tufts.edu`). *Multilinear Algebra and Tensors.* Preliminary report.

Using a novel method of order preserving tensor multiplication, we have defined several operators for this definition of tensor multiplication. We have extended several matrix decompositions to tensors, and explored their applications in video compression as well as facial recognition. In this talk we will be discussing the implementation of the tensor multiplication for third order and higher cases, as well as the construction of the operators and decompositions. (Received July 01, 2010)