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**Nicole Eikmeier\*** (eikmeier@purdue.edu) and **David F. Gleich**. *Hypergraph Kronecker models for Networks*.

A Kronecker model for a network consists of a random draw from a matrix of edge probabilities arising from repeated Kronecker products between matrices. We explore a simple generalization of this model to generate a regular hypergraph by creating a tensor of edge probabilities via repeated tensor Kronecker products. A sample from this hypergraph distribution is then collapsed into a network model by treating each hyperedge as a motif, such as a triangle. We discuss efficient strategies to generate these networks and show there are surprising number of connections with topics across discrete mathematics, including Morton codes and ranking and unranking multiset permutations. We fit the HyperKron model to real-world networks, and demonstrate the model's flexibility with a complex application of the HyperKron model to networks with coherent feed-forward loops. (Received September 03, 2018)