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Jonathan D Hauenstein* (hauenstein@nd.edu), **Danielle A Brake**, **Frank-Olaf Schreyer**, **Andrew J Sommese** and **Michael E Stillman**. *Singular value decomposition of chain complexes.*

Singular value decompositions for matrices are widely used in numerical linear algebra with many applications including pseudoinversion and low-rank approximation. Relating matrices and linear maps, a finite chain complex is simply a finite sequence of matrices where the image of one is included in the kernel of the next. With this identification, this talk will describe an extension of singular value decomposition to finite complexes which naturally incorporates the chain complex structure. Computational algorithms and several applications including pseudoinversion of a chain complex and projecting a sequence of matrices onto a chain complex will be presented. (Received January 24, 2019)