1037-15-348   **Vin de Silva*** (`Vin.deSilva@pomona.edu`), 610 North College Avenue, Claremont, CA 91711, and **Lek-Heng Lim** (`lekheng@math.berkeley.edu`), 873 Evans Hall, Berkeley, CA 94720. *Tensor approximation and the Cayley hyperdeterminant.*

Whereas the Eckart-Young theorem for matrices gives a conclusive answer to the problem of finding a best low-rank approximation to a given matrix, there is no analogous theorem for hypermatrices of higher order. Indeed the problem turns out to be ill-posed in essentially all non-trivial cases, because of the failure of tensor rank to be upper-semicontinuous. In this talk we will dissect the somewhat unexpected structure of the rank function for real $2 \times 2 \times 2$ hypermatrices. The Cayley hyperdeterminant is our chosen scalpel. (Received February 05, 2008)