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**Vin de Silva\*** ([Vin.deSilva@pomona.edu](mailto:Vin.deSilva@pomona.edu)), Department of Mathematics, 610 North College Avenue, Claremont, CA 91711, and **Lek-Heng Lim** ([lekheng@math.berkeley.edu](mailto:lekheng@math.berkeley.edu)), Department of Mathematics, 873 Evans Hall, Berkeley, CA 94720. *Secant varieties and optimal low-rank approximations of tensors.*

There has been continued interest in seeking a theorem describing optimal low-rank approximations to tensors of order 3 or higher, that parallels the Eckart-Young theorem for matrices. It is now widely appreciated that such a theorem cannot exist for the standard definition of tensor rank: a sequence low-rank tensors can easily converge to a tensor of higher rank. We will discuss this “rank-jumping” phenomenon in some detail, for selected low-rank, low-dimensional examples. In the smallest interesting case — rank-2 sequences of 2-by-2-by-2 tensors — the Cayley hyperdeterminant plays a crucial role. (Received September 20, 2007)