1163-15-900 **Zi Yang*** (`ziy109@ucsd.edu`) and **Jiawang Nie**. *Hermitian Tensor Decompositions.*

Hermitian tensors are generalizations of Hermitian matrices, but they have very different properties. Every complex Hermitian tensor is a sum of complex Hermitian rank-1 tensors. However, this is not true for the real case. We study basic properties for Hermitian tensors such as Hermitian decompositions and Hermitian ranks. For canonical basis tensors, we determine their Hermitian ranks and decompositions. For real Hermitian tensors, we give a full characterization for them to have Hermitian decompositions over the real field. In addition to traditional flattening, Hermitian tensors specially have Hermitian and Kronecker flattenings, which may give different lower bounds for Hermitian ranks. We also study other topics such as eigenvalues, positive semidefiniteness, sum of squares representations, and separability. (Received September 14, 2020)