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Alessandro De Paris* (deparis@unina.it), Dipartimento di Matematica e Applicazioni,
"Renato Caccioppoli", via Cintia, Monte S. Angelo, I-80126 Napoli, NA, Italy. *A short talk on
lengthy symmetric tensor decompositions.*

To date, a systematic knowledge on CP decompositions and tensor rank is still under construction, and several related problems of basic nature are still to be solved. For instance, the maximum rank for tensors of given size is unknown, apart from special cases. The same problem for the symmetric rank is unsolved as well, in spite of the fact that it is equivalent to a classical Waring problem on polynomials, which had already been considered in a geometric framework nearly a century ago.

We discuss some techniques that have led to the best known upper bound on the Waring rank of ternary forms of given degree. To go further and detect the actual maximum, it is reasonable to investigate the structure of the variety of all decompositions of length equal to the expected answer: we illustrate some progress in that direction. (Received October 14, 2019)