Abstract: Given a system of $n$ vectors from $\mathbb{C}^m$, we want to find a subsystem consisting of $k$ vectors so that the expansion of any other vector over this subsystem has the coefficients sufficiently small in modulus. The maximal volume principle allows one to find a subsystem of $k = m$ vectors with a guarantee that all expansions have the coefficients in modulus bounded by 1. If we increase $k$, then smaller coefficients could be obtained. We present different settings of the problem and some new results and discuss applications to the problem of construction of low-rank approximations to matrices and tensors.