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*Classification of toric bundles on toric varieties*

In 1989 Klyachko gave a combinatorial classification of toric vector bundles on toric varieties. In joint work with Kiumars Kaveh we find two more classifications of toric vector bundles, the first in terms of piecewise linear maps to spherical Tits buildings, and the second in terms of prevaluations on vector spaces taking values in a certain semialgebra of piecewise linear functions. The first classification allows us to reinterpret DiRocco, Jabbusch, and Smith's positivity results on toric vector bundles in terms of convexity properties of buildings, and it allows us to generalize Klyachko's classification to toric principal bundles, where the fiber of the bundle is a connected reductive group. The second classification result also generalizes, in this case to toric flat families of varieties, and yields interesting connections with tropicalization and the theory of Newton-Okounkov bodies.