Coloring uniform simple hypergraphs with few edges
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A hypergraph is simple, if every two distinct edges have at most one common vertex. A well-known problem in hypergraph coloring is to estimate $m^*(r, k)$ – the minimum number of edges in an $r$-uniform simple hypergraph that is not $k$-colorable. In this talk, we discuss the bounds on $m^*(r, k)$ obtained in the classical paper by Erdős and Lovász. We somewhat improve some of their bounds and generalize results to $b$-simple hypergraphs, i.e., the hypergraphs in which no two edges have more than $b$ vertices in common. The talk is based on joint works with M. Kumbhat and V. Rödl.