A Generalization of the Lovász Local Lemma

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The Lovász Local Lemma is a very important and powerful tool in probabilistic combinatorics, that is often used to prove existence of combinatorial objects satisfying certain constraints. Moser and Tardos have shown that the LLL actually provides more than just pure existence results: there is an effective randomized algorithm that can be used to find the desired object. In order to analyze this algorithm Moser and Tardos developed the so-called *entropy compression method*. It was discovered lately (and somewhat unexpectedly) that one can obtain better combinatorial results by a direct application of the entropy compression method rather than simply appealing to the LLL. We provide a general and purely probabilistic statement that implies both these new combinatorial results and the LLL itself.