

SIEGEL'S LEMMA IS USUALLY SHARP

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ABSTRACT: With Roger Baker we have shown that the classical upper bound $c(N)U^{\frac{M}{N-M}}$ for the size of a non-zero solution of a system of M homogeneous linear equations in $N > M$ variables, with rational integer coefficients of absolute values at most $U \geq 1$, usually cannot be improved; more precisely there is $\delta = \delta(N) > 0$ such that given any $B \geq 1$ the upper bound $U^{\frac{M}{N-M}}/B$ can be achieved for at most $C(N)U^{MN}/B^\delta$ of the roughly $(2U)^{MN}$ possible systems. In this talk we describe some of the background and sketch the proof.