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Height bounds on zeros of quadratic forms over $\overline{\mathbb{Q}}$. Preliminary report.

We prove the existence of a nontrivial small-height zero of a system of k quadratic forms in an L -dimensional subspace of $\overline{\mathbb{Q}}^N$, $N \geq L \geq \frac{k(k+1)}{2} + 1$. Further, assuming a system of one or two inhomogeneous quadratic polynomials and m inhomogeneous linear polynomials in $N \geq m + 4$ variables has a nontrivial common zero over $\overline{\mathbb{Q}}$, we prove the existence of a such zero of bounded height. Our investigation extends previous results on small zeros of quadratic forms, including Cassels' theorem and its various generalizations and contributes to the literature of so-called "absolute" Diophantine results with respect to height. All bounds on height are explicit. (Received January 28, 2015)