Abstract

Let $\mathbf{F} = (F_1, \ldots, F_m)$ be an m-tuple of primitive positive binary quadratic forms and let $U_{\mathbf{F}}(x)$ be the number of integers not exceeding x that can be represented simultaneously by all the forms F_j, $j = 1, \ldots, m$. Sharp upper and lower bounds for $U_{\mathbf{F}}(x)$ given, uniformly in the discriminants of the quadratic forms.
As an application a problem of Erdös is considered. Let $V(x)$ be the number of integers not exceeding x that are representable as a sum of two squareful integers. Then $V(x) \ll x(\log x)^{-\alpha+o(1)}$ with $\alpha = 1 - 2^{-\frac{1}{3}} = 0.206\ldots$

MSC (2000) *11N25, 11E16, 11E25, 11N37

Keywords: sums of two squareful integers, binary quadratic forms, uniform asymptotic behaviour