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Jingbo Liu* (jliu02@wesleyan.edu). *Representations of integral Hermitian forms by sums of norms.*

In 1770, Lagrange proved the famous four square theorem, which says that each positive integer a can be represented as a sum of four squares. This theorem has been generalized in many directions since then. One interesting generalization is to consider the representation of integral quadratic forms of more variables by sums of squares.

We define $g_{\mathbb{Z}}(n)$ to be the smallest number of squares whose sum represents all positive definite integral quadratic forms of n variables over \mathbb{Z} that are represented by some sums of squares. The existence of $g_{\mathbb{Z}}(n)$ and an explicit upper bound was given by M. Icaza in 1996. An improved upper bound was obtained later by Kim and Oh in 2005.

Similarly, for Hermitian forms over the ring of integers \mathcal{O}_E of imaginary quadratic field E , we define $g_E(n)$ to be the smallest number of norms whose sum represents all positive definite integral Hermitian forms of n variables over \mathcal{O}_E that are represented by some sums of norms. In this talk, we will present a generalization of Kim and Oh's method and give an explicit upper bound for $g_E(n)$ for any imaginary quadratic field E and positive integer n . (Received September 06, 2015)