

# COUNTING LATTICE POINTS AND O-MINIMAL STRUCTURES

ABSTRACT. Let  $\Lambda$  be a lattice in  $\mathbb{R}^n$ , and let  $Z \subseteq \mathbb{R}^{m+n}$  be a parameterized family of subsets  $Z_T$  of  $\mathbb{R}^n$ . We are interested in the cardinality  $|\Lambda \cap Z_T|$ . Using o-minimal structures from model theory we prove for fairly general families  $Z$  an estimate which is also quite precise in terms of the successive minima of the lattice, and the  $j$ -dimensional volumes of the projections of  $Z_T$  to the  $j$ -dimensional coordinate spaces (where  $1 \leq j \leq n-1$ ). This is joint work with Fabrizio Barroero.