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Abstracts of Short Communications and Posters

Section:

3. Number Theory and Arithmetic Algebraic Geometry

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Computing even, unimodular lattices with complete root systems
Let $\Lambda \subset \mathbb{R}^n$ be an integral lattice (i. e., a $\mathbb{Z}$-module of rank n such that $\langle x, y \rangle \in \mathbb{Z}$ for all $x, y \in \Lambda$, where $\langle\ ,\ \rangle$ denotes the usual Euclidean product) with basis $\lambda_1, \ldots, \lambda_n$. Let S be the $n \times n$ matrix consisting of entries $s_{ij} = \langle \lambda_i, \lambda_j \rangle$. Λ is called unimodular if $|\det S| = 1$. It is said to be even if $\langle x, x \rangle \in 2\mathbb{Z}$ for all $x \in \Lambda$. The root system R_Λ of Λ, given by

$$R_\Lambda = \{x \in \Lambda \mid \langle x, x \rangle = 2\},$$

is complete if $[\Lambda : R_\Lambda] < \infty$. Techniques for computing a particular class of even, unimodular lattices with complete root systems are discussed.