Computations of Cyclotomic Lattices

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Abstract

We study even modular lattices having level l and dimension $2(p-1)$, for p prime, and arising from the ideal class group of the p-th cyclotomic extension of $\mathbb{Q}(\sqrt{-l})$. After giving the basic theory we concentrate on Galois-invariant ideals, obtain computational results on minimal vectors and isometries, and identify several old or new extremal lattices.