# Correction to: “The Ternary Golay Code, the Integers Mod 9 and the Coxeter-Todd Lattice,” [IEEE Trans. Inform. Theory, 42 (1996), 636–637]

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July 21, 2002

The lattice described in this paper is not the Coxeter-Todd lattice.

Since lifting the binary Golay code to $\mathbb{Z}_4$ and applying Construction A produced the Leech lattice [1], it seemed so obvious to us that lifting the ternary Golay code to $\mathbb{Z}_9$ [2] would produce the Coxeter-Todd lattice that we were careless and made an elementary blunder in computing the determinant, which should have been $3^{12}$ rather than $3^6$. The minimal norm is indeed 4, as claimed, but the center density is only 1/729 not 1/27, and this is not the Coxeter-Todd lattice.

The error was posted at once on NJAS's home page, and the lattice itself (with the correct determinant) was added to the lattice database [3]). We delayed publishing this correction in the hope of finding an alternative way to get the Coxeter-Todd lattice from the ternary Golay code, but so far have not found one.

In fact no integer generator matrix of the form

$$\begin{bmatrix} 9I & 0 \\ B & I \end{bmatrix}$$

(where the four blocks have size $6 \times 6$) can produce the Coxeter-Todd lattice, since this would require the minimal sqaured length in the lattice to be $12\sqrt{3}$, which is not an integer.

## References

[1] A. Bonnecaze, A. R. Calderbank and P. Solé, Quaternary quadratic residue codes and unimodular lattices, *IEEE Trans. Inform. Theory*, **41** (1995), 366–377 and 1536.

[2] A. R. Calderbank and N. J. A. Sloane, The ternary Golay code, the integers mod 9 and the Coxeter-Todd lattice, *IEEE Trans. Inform. Theory*, **42** (1996), 636–637.

[3] G. Nebe and N. J. A. Sloane, *A Catalogue of lattices*, published electronically at http://www.research.att.com/∼njas/sequences.