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INTEGRAL EQUIVALENCE OF VECTORS OVER LOCAL MODULAR LATTICES, II

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In an earlier paper in this Journal we have shown that the integral equivalence problem for vectors in a modular lattice L on a dyadic local field F can be determined, for $\dim L \neq 4$, 5, 6, by inspecting the numbers represented in F by the characteristic sets which are canonically associated to the given vectors. The purpose of this paper is to remove this dimensional restriction of L. In addition, we shall discuss the effective determination of integral equivalences amongst vectors as well as derive some "cancellation" results. Finally, we prove, as expected, that this same improvement carries over in the characteristic two situation.

The presentation of the results contatined herein shall be as follows:

1. Preliminary observations.
2. Statement and proof of the main theorem.
3. Effective computability.
4. Cancellation theorems.
5. Characteristic two case.

We shall adhere to the same terminology and notations as those contained in [2]. The following data will be fixed throughout this paper. L is a unimodular lattice, u and v are two maximal (primitive) vectors in L having the same quadratic length $Q(u) = Q(v) = \delta$. Integral equivalence between u and v shall always be denoted by $u \sim v$.

1. Preliminary observations.

For any maximal vector $w \in L$, the characteristic set of w in L is defined as

$$\mathfrak{M}_w = \{x \in L \mid B(x, w) = 1\} .$$

It is easy to see that

$$\mathfrak{M}_w = \hat{w} + \langle w \rangle^{\perp} = \{\hat{w} + y \mid y \in \langle w \rangle^{\perp}\}$$

where $\hat{w}$ is *any* vector in $\mathfrak{M}_w$.

NOTATION 1.1. Almost always when we write

$$\mathcal{O}x + \mathcal{O}y \cong A(\alpha, \beta)$$

we mean that