On Lattices over Valuation Rings of Arbitrary Rank

Abstract:

We show how the simple property of 2-Henselianiety suffices to reduce the classification of lattices over a general valuation ring in which 2 is invertible (with no restriction on the value group) to classifying quadratic spaces over the residue field. The case where 2 is not invertible is much more difficult. In this case we present the generalized Arf invariant of a unimodular rank 2 lattice, and show how in case the lattice contains a primitive vector with norm divisible by 2, a refinement of this invariant and a certain class suffice for classifying these lattices.