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Algorithms for p-adic group rings

Let $(k, \mathcal{O}, K)$ be a p-modular system. Some algorithms are presented that allow calculations in the module category of an $\mathcal{O}$-order Λ in a separable K-algebra A. In particular the methods admit calculation of the projective indecomposable Λ-lattices as amalgams of irreducible lattices. An application is the calculation of basic algebras of a group ring $\mathcal{O}G$, provided the irreducible ordinary representations of G are known. The algorithms have been implemented using the computer algebra system GAP.