

Modules for elementary abelian p -groups and hypersurface singularities

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Let E be an elementary abelian p -group, namely a finite product $(\mathbb{Z}/p)^r$ of copies of \mathbb{Z}/p , and let k be a field of characteristic p . Then the group algebra kE can be regarded as a complete intersection. This allows us to use the Orlov correspondence to relate its stable module category with the singularity category of a certain hypersurface. I shall describe explicitly the functors involved, between kE -modules and matrix factorisations over this hypersurface. The trivial kE -module corresponds to a $2^{r-1} \times 2^{r-1}$ matrix factorisation coming from a bidirectional Koszul complex. I shall describe the relationship between this correspondence and a recent construction with Julia Pevtsova in the stable module category. This talk is inspired by a talk of Mark Walker last July in Seattle.