

Results

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When a solvable group S acts coprimely on a finite group G , there is a one-to-one correspondence between the set of S -invariant irreducible characters of G and the set of irreducible characters of the S -centralized subgroup $C_G(S)$ of G , called the Glauberman correspondence. If S acts on a defect group of a (p -)block of G , A.Watanabe showed that the Glauberman correspondence induces a block correspondence, called the Glauberman-Watanabe correspondence, and there is an isotypy between corresponding blocks. Here, isotypy is a phenomenon in a character level, which can be viewed as a shadow of a splendid derived equivalence.

In [1](of a list of papers), we showed that, under some conditions, the Dade correspondence, which is a character correspondence partly generalizing the Glauberman correspondence, induces a block correspondence, and that there is an isotypy between corresponding blocks. Its proof suggests the existence of the two sided tilting complex having a particular form. On the other hand, we characterize the Dade correspondence as the correspondence of some elements of group algebras, using the projection maps and the trace maps. As a corollary, we give an explicit isomorphism between the centers of the corresponding blocks.

In [2], we showed that a particular form complex (noted by T.Okuyama) gives a derived equivalence between the Glauberman-Watanabe corresponding blocks with normal defect groups. In fact, a Morita equivalence between corresponding blocks is given by a decomposition of the restriction functor. For its proof, we consider the “Glauberman correspondence” for G -algebras. This correspondence can be applied to G -algebras constructed from endomorphism rings of the modules over G with simple defect multiplicity modules, and we get some correspondence between modules over G and $C_G(S)$, which coincides with the Green correspondence under common assumptions.

In [3], we showed that the particular form complex gives a derived equivalence between the Glauberman-Watanabe corresponding blocks of p -nilpotent groups with cyclic Sylow p -subgroups.