Reserch Plan

Fuminori Tasaka

T.Okuyama raised a question: Is there a complex giving a derived equivalence between the Glauberman-Watanabe corresponding (p-)blocks and having some prescribed form? We showed that this is true when blocks have normal defect groups ([2]) and when groups are p-nilpotent groups with cyclic Sylow p-subgroups([3]). We will study the problem under more general situations.

We will study the problem when groups are p-solvable groups. This also has a relation to the module theoretic understanding of the Glauberman correspondence of modular characters of p-solvable groups showed by K.Uno. It may be hopeful to start by the situation where p-solvable groups have abelian Sylow p-subgroups. In fact, it is known that the consideration of the blocks of p-solvable groups having abelian Sylow p-subgroups is reduced to the consideration of the blocks of the groups with p-length one, which is obtained by p'-extension of p-nilpotent groups. Hence, in abelian case the problem may be solved if the following two problems are solved: a generarization of the results in [3] to abelian p-groups and a problem of a "p'-extension" of the complex with the particular form.

We will study the problem when blocks have cyclic defect groups. In fact, in the consideration of cyclic blocks, consideration of nilpotent blocks and its "p'-extension" play an important role. Blocks of p-nilpotent groups are typical examples of nilpotent blocks and a generalization of the results in [3] to nilpotent blocks will be useful to the consideration of cyclic blocks.