## Endo-permutation modules arising from the action of $p$-group on a defect zero block

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Abstract

Let $p$ be an odd prime and let $k$ be an algebraically closed field of characteristic $p$. Also let $G$ be a $p'$-group. Maschke's Theorem says $kG = \prod \mathrm{End}_k(L)$. Suppose a $p$-group $P \leq \mathrm{Aut}(G)$ stabilizes $\mathrm{End}_k(L)$ for some $L$. One can show that such an $L$ is an endo-permutation $kP$-module. Puig showed the only modules that occur in this way are those whose image is torsion in the Dade group.

If we let $G$ be any finite group and let $B$ be a defect zero block of $kG$, then $B \cong \mathrm{End}_k(L)$ and $L$ will again be an endopermutation $kP$-module. It is conjectured that the only such $L$ will be torsion in the Dade group. We show a reduction of this problem to the classification of finite simple groups.

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