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Class-preserving automorphisms and the normalizer property for Blackburn groups. (English) Zbl 1168.16017

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Let G be a group and let $\mathcal{U}$ be the group of units of the integral group ring $\mathbb{Z}G$. The group G is said to have the 'normalizer property' if $N_{\mathcal{U}}(G) = Z(\mathcal{U})G$, where $Z(\mathcal{U})$ denotes the center of $\mathcal{U}$ and $N_{\mathcal{U}}(G)$ is the normalizer of G in $\mathcal{U}$. If G has finite non-normal subgroups, then, following Blackburn, the authors denote by $R(G)$ the intersection of all of them and say that $R(G)$ is defined. The group G is said to be a 'Blackburn group' if $R(G)$ is defined and non-trivial. The authors denote with $\mathrm{Aut}_c(G)$ the group of class-preserving automorphisms of G, and set $\mathrm{Out}_c(G) = \mathrm{Aut}_c(G)/\mathrm{Inn}(G)$.

The paper is organized as follows: Section 1 is an introduction. In Section 2 the authors study class-preserving automorphisms.

The main results are: Proposition 2.7. Let G be a finite group having an Abelian normal subgroup A with cyclic quotient G/A. Then class-preserving automorphisms of G are inner automorphisms.

Proposition 2.9. A class-preserving automorphism of a finite Blackburn group is an inner automorphism.

The main result of Section 3 is the following: Theorem 3.3. Suppose that G has a finite non-normal subgroup, and that $R(G)$ is non-trivial. Then G has the normalizer property, $N_{\mathcal{U}}(G) = Z(\mathcal{U})G$.

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MSC:

16U60	Units, groups of units (associative rings and algebras)
20E36	Automorphisms of infinite groups
16S34	Group rings
20C05	Group rings of finite groups and their modules (group-theoretic aspects)
20C07	Group rings of infinite groups and their modules (group-theoretic aspects)

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