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RESIDUAL PROPERTIES AND LINEAR REPRESENTATION OF GROUPS

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Let $\mathfrak{X}$ be a class of groups. A group G is referred to as super-residually $\mathfrak{X}$ if for every finite subset $X \subset G$ there exists normal subgroup $N \lhd G$ such that $G/N \in \mathfrak{X}$ and $xN \neq yN$ for all $x, y \in X$. A group G is referred to as residually $\mathfrak{X}$ if for every element $x \in G$ there exists normal subgroup $N \lhd G$ such that $G/N \in \mathfrak{X}$ and $xN \neq N$.

In the paper [1] some sufficient conditions for an isomorphic representation over a field of a group by matrices and a criterion of the linear representation for finitely generated groups are presented. The criterion is based by fact that a group must be super-residually $\mathcal{L}(n, R)$ where $\mathcal{L}(n, R)$ is a class of $n \times n$-matrix groups with coefficients from some class of commutative associative rings involving all fields. This result generalizes a similar criterion due to Mal'cev [2].

References

[1] O. V. Bryukhanov, “Approximation properties and linearty of groups”, *J. of Math. Sciences*, Vol. 188, No. 4, 354-358 (2013).

[2] A. I. Mal'cev, “On the faitful representation of ifinite groups by matrices”, *Am. Math. Soc. Transl. Ser.*, Vol. 2, No. 45, 1-18 (1965).

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