

VARIETIES OF GROUPS AND CELLULAR COVERS

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A group homomorphism $e : H \rightarrow G$ is a cellular cover of G if for any homomorphism $\varphi \in \text{Hom}(H, G)$ there is a unique homomorphism $\bar{\varphi} : H \rightarrow H$ such that $\bar{\varphi}e = \varphi$.

A. Yu. Ol'shanskii established in 1970 the existence of 2^{\aleph_0} varieties of groups. We modify his result and show that there exist 2^{\aleph_0} pairwise distinct varieties of groups which are not closed under taking cellular covers by applying the existence of a special Burnside group of exponent p for a sufficiently large prime p . This answers a question raised by R. Göbel [Forum Math., Vol. 24 (2012), 317-337]. Moreover, by similar arguments we can conclude a dual result for localizations which are defined similarly to cellular covers as group homomorphisms $e : G \rightarrow H$ such that for any homomorphism $\varphi \in \text{Hom}(G, H)$ there is a unique homomorphism $\bar{\varphi} : H \rightarrow H$ with $e\bar{\varphi} = \varphi$.