THE ENDOMORPHISM KERNEL PROPERTY FOR MONOUNARY ALGEBRAS

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Let $\mathcal{A}$ be an algebra. If every congruence on $\mathcal{A}$ is a kernel of some endomorphism of $\mathcal{A}$, then we say that an algebra $\mathcal{A}$ has an *endomorphism kernel property*. Shortly we will write that $\mathcal{A}$ has EKP. Finite Boolean algebras, finite chains possess EKP. A finite bounded distributive lattice has EKP if and only if it is a product of chains, cf. [1]. The algebra $\mathcal{A}$ has EKP if and only if every homomorphic image of $\mathcal{A}$ is isomorphic to a subalgebra of $\mathcal{A}$.

We focus on monounary algebras, i.e. algebras with one unary operation that is by f denoted. Homomorphisms of monounary algebras are elaborated in great details, cf. [2], [3]. They give several properties equivalent with EKP, which will be presented.

A finite monounary algebra has EKP if and only if it contains at most one non-trivial component and elements x such that $f(x)$ is not cyclic create a chain of the algebra.

Four classes of (infinite) algebras will be considered and all algebras with EKP from these classes will be described. The first is the class of all algebras with injective operation, others are subclasses of the class of all connected monounary algebras.

References

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[3] D. Jakubíková-Studenovská, J. Pócs, *Monounary algebras*, P. J. Šafárik University in Košice, 2009.

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