

Endomorphisms semigroups of orthogonal sum and band of semigroups

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Automorphisms groups of orthogonal sum of semigroups and free product of π -regular semigroups have been described in the papers [1, 2].

In this work endomorphisms semigroups of band of semigroups which are indecomposable in band and free product of π -regular semigroups are described.

The terminology and the designations correspond to adopted ones in [3].

Let I be an arbitrary nonempty set, $S^0 = S \cup \{0\}$ is a semigroup with zero adjoined.

A semigroup of all row-monomial $I \times I$ matrices over a semigroup S^0 will be denoted by $A(I; S^0)$.

Let $R = \{S_i\}_{i \in X}$ is a family of arbitrary semigroups. For every pair $(i; j) \in X \times X$ through $D^{(i;j)}$ we denote the set of all homomorphisms $\lambda : S_i \rightarrow S_j$ and assuming $B = \bigcup_{(i,j) \in X \times X} D^{(i;j)}$.

The partial operation \bullet of homomorphisms composition is naturally defined on B . On $B \cup \{0\}$ (where 0 is outer idempotent) the product is defined by

$$\lambda * \rho = \begin{cases} \lambda \bullet \rho, & j = m \\ 0, & j \neq m \end{cases},$$

$$\lambda * 0 = 0 * \lambda = 0 * 0 = 0$$

for all $\lambda \in D^{(i;j)}, \rho \in D^{(m;p)}$. The semigroup that is obtained will be denoted by $B^0[R]$.

Let H_1 be a band I_1 of semigroups $S_i, i \in I_1$ which are indecomposable in band, H_2 be a free product of π -regular semigroups $S_i, i \in I_2$. For every $m \in \{1, 2\}$ assuming $F_m = \{S_i\}_{i \in I_m}$.

Theorem. For every $m \in \{1, 2\}$ there exists monomorphism

$$EndH_m \rightarrow A(I_m; B^0[F_m]).$$

Besides it is proved that automorphisms group of band of semigroups which are indecomposable in band is isomorphic embedding in the direct product of wreath products of groups. The structure of endomorphisms semigroup of orthogonal sum of semigroups is investigated too.

References

[1] A.Zhuchok, Automorphisms groups of orthogonal sum of semigroups //VI International Algebraic Conference in Ukraine, Abstracts, July 1-7, 2007, Kamyanets-Podilsky, Ukraine, p.233.

[2] A.Zhuchok, Automorphisms groups of free product of π -regular semigroups //XII International Conference on Representation Theory and Workshop, 15-24 august, 2007, Torun, Poland, Abstracts, p.77-78.

[3] .H.lifford, G.B.Preston, The algebraic theory of semigroups, vol.1,2, American Mathematical Society, 1964,1967.

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