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On full subdirect products of a bi-semilattice and a (zero-symmetric) near-ring

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In order to find an analogue of the structure theorem,"a semigroup is a full subdirect product of a semilattice and a group if and only if it is an E-inversive sturdy semilattice of cancellative monoids (Theorem 14 of [H. Mitsch, Subdirect products of E-inversive semigroups, *J. Austral. Math. Soc.* **48** (1990) 66–78])", in the setting of seminearrings we have characterized the seminearrings which are full subdirect products of a bi-semilattice and a (zero-symmetric) near-ring and which are subdirect products of a distributive lattice and a (zero-symmetric) near-ring.

Keywords: E^+-inversive seminearring; (full) subdirect product; bi-semilattice; distributive lattice; additively cancellative seminearring; (zero-symmetric) near-ring.

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1. Introduction

According to Pilz [22], a *near-ring* is a non-empty set N together with two binary operations "+" and "·" such that (i) $(N, +)$ is a group (not necessarily abelian), (ii) $(N, \cdot)$ is a semigroup (not necessarily commutative), and (iii) for all $n_1, n_2, n_3 \in N$, $(n_1 + n_2) \cdot n_3 = n_1 \cdot n_3 + n_2 \cdot n_3$, i.e. "·" distributes over "+" from the right side ("right distributive law"). It is well known that if G is an additive group (not necessarily abelian) then the set of all mappings from G into G forms a near-ring under point-wise addition and composition of mappings [22]. In the natural