Title: On several classes of additively non-regular $C$-semirings

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In this paper, the authors study several classes of additively non-regular $C$-semirings whose additive idempotents are central, including the generalized $C$-rpp semirings, $C$-rpp semirings, generalized $C$-abundant semirings and $C$-abundant semirings. After introducing the concept of generalized $C$-rpp semirings, the authors obtain their equivalent characterizations, and show that a semiring is a generalized $C$-rpp semiring if and only if it is a strong b-lattice of additively left cancellative halfrings, and if and only if it is a subdirect product of a b-lattice and an additively left cancellative halfring. Also, the authors give the constructions of $C$-rpp semirings, generalized $C$-abundant semirings and $C$-abundant semirings. Consequently, the corresponding results of Clifford semirings and generalized Clifford semirings in [7] and [29] are extended and generalized.

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