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Weak alg-universality and Q -universality of semigroup quasivarieties

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Abstract: In an earlier paper, the authors showed that standard semigroups \mathbf{M}_1 , \mathbf{M}_2 and \mathbf{M}_3 play an important role in the classification of weaker versions of alg-universality of semigroup varieties. This paper shows that quasivarieties generated by \mathbf{M}_2 and \mathbf{M}_3 are neither relatively alg-universal nor Q -universal, while there do exist finite semigroups \mathbf{S}_2 and \mathbf{S}_3 generating the same semigroup variety as \mathbf{M}_2 and \mathbf{M}_3 respectively and the quasivarieties generated by \mathbf{S}_2 and/or \mathbf{S}_3 are quasivar-relatively *ff*-alg-universal and Q -universal (meaning that their respective lattices of subquasivarieties are quite rich). An analogous result on Q -universality of the variety generated by \mathbf{M}_2 was obtained by M.V. Sapir; the size of our semigroup is substantially smaller than that of Sapir's semigroup.

Keywords: semigroup quasivariety, full embedding, *ff*-alg-universality, Q -universality

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