Czechoslovak Mathematical Journal, 54 (129) (2004), 303–313

ON THE EMBEDDING OF ORDERED SEMIGROUPS INTO ORDERED GROUP

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(Received May 28, 2001)

Abstract. It was shown in [7] that any right reversible, cancellative ordered semigroup can be embedded into an ordered group and as a consequence, it was shown that a commutative ordered semigroup can be embedded into an ordered group if and only if it is cancellative. In this paper we introduce the concept of L-maher and R-maher semigroups and use a technique similar to that used in [7] to show that any left reversible cancellative ordered L or R-maher semigroup can be embedded into an ordered group.

Keywords: semicommutative semigroups, maher semigroups, ordered semigroups

MSC 2000: 06F05

1. Introuction and premliminaries

The concept of L-semicommutative (R-semicommutative) semigroups was first introduced in [1]. A semigroup $(S,*)$ is called L-semicommutative if and only if $\forall a,b\in S\colon\ a*b*a=a^2*b$ and R-semicommutative if and only if $\forall a,b\in S\colon\ a*b*a=b*a^2$. Clearly any commutative semigroup is both L-semicommutative and R-semicommutative and any cancellative L-semicommutative or R-semicommutative semigroup is commutative.

A semigroup $(S,*)$ is called left (right) reversible if $\forall a,b\in S\colon\ a*S\cap b*S\neq\emptyset$ ($S*a\cap S*b\neq\emptyset$). An R-semicommutative (L-semicommutative) semigroup is left (right) reversible. It is well known that any right reversible cancellative semigroup can be embedded in a group [2], Theorem 1.23. Kehayopulu and Tsingleis [7] proved that a commutative ordered semigroup is embeddable in an ordered group if and only if it is cancellative. The following theorem is an immediate consequence of the main theorem in [7].