Additive Closure Operators on Abelian Unital \( l \)-groups

FILIP ŠVRČEK

Department of Algebra and Geometry, Faculty of Science, Palacký University,
Tomkova 40, 779 00 Olomouc, Czech Republic
e-mail: filipsvrcek@inf.upol.cz

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Abstract

In the paper an additive closure operator on an abelian unital \( l \)-group
\((G, u)\) is introduced and one studies the mutual relation of such operators
and of additive closure ones on the MV-algebra \( \Gamma(G, u) \).

Key words: MV-algebra; \( l \)-group.

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1 Introduction

In [6] additive closure (and multiplicative interior) operators on MV-algebras
were introduced as a natural generalization of topological closure (and interior)
operators on Boolean algebras. Closure and interior MV-algebras (MV-algebras
endowed with additive closure or multiplicative interior operators) generalize
topological boolean algebras in a natural way.

Let us recall the notions of an MV-algebra and of an additive closure oper-
ator on an MV-algebra.

Definition 1.1 An algebra \( A = (A, \oplus, \neg, 0) \) of the signature \( \langle 2, 1, 0 \rangle \) is called
an MV-algebra iff for each \( x, y, z \in A \):

\[
\begin{align*}
(MV1) \quad x \oplus (y \oplus z) &= (x \oplus y) \oplus z; \\
(MV2) \quad x \oplus y &= y \oplus x;
\end{align*}
\]