

## FOLDNESS OF COMMUTATIVE IDEALS IN BCK-ALGEBRAS

CELESTIN LELE

*University of Dschang, Department of Mathematics  
BP 67 Dschang, Cameroon*

**e-mail:** lele\_clele@yahoo.com

AND

SALISSOU MOUTARI

*Laboratory J. A Dieudonné UMR CNRS N° 6621  
University of Nice-Sophia Antipolis  
Parc Valrose 06108 Nice Cedex 2, France  
**e-mail:** salissou@math.unice.fr*

### Abstract

This paper deals with some properties of  $n$ -fold commutative ideals and  $n$ -fold weak commutative ideals in BCK-algebras. Afterwards, we construct some algorithms for studying foldness theory of commutative ideals in BCK-algebras.

**Keywords:** BCK-algebra, fuzzy point,  $n$ -fold commutative ideals,  $n$ -fold weak commutative ideals.

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### REFERENCES

- [1] J. Meng, *On ideals in BCK-algebras*, Math. Japonica **40** (1994), 143–154.

- [2] J. Meng and X. Guo, *On fuzzy ideals in BCK/BCI-algebras*, Fuzzy Sets and Systems **149** (2005), 509–525.
- [3] J. Meng, Y.B. Jun and H.S. Kim, *Fuzzy implicative ideals of BCK-algebras*, Fuzzy Sets and Systems **89** (1997), 243–248.
- [4] Y.B. Jun and E.H. Roh, *Fuzzy commutative ideals in BCK-algebras*, Fuzzy Sets and Systems **64** (1994), 401–405.
- [5] Y.B. Jun, *Characterization of Noetherian in BCK-algebras via fuzzy ideals*, Fuzzy Sets and Systems **108** (1999), 231–234.
- [6] Y.B. Jun, S.Z. Song and C. Lele, *Foldness of quasi-associative ideals in BCI-algebras*, Scientiae Mathematicae **6** (2002), 227–231.
- [7] Y.B. Jun and K.H. Kim, *Fuzzifications of foldness of quasi-associative ideals in BCI-algebras*, J. Appl. Math. Computing **11** (2003), 255–263.
- [8] Y.B. Jun and C. Lele, *Fuzzy point BCK/BCI-algebras*, International Journal of Pure and Applied Mathematics **1** (2002), 33–39.
- [9] Y.B. Jun, *On n-fold fuzzy implicative/commutative ideals of BCK-algebras*, IJMMS, (2001), 419–424.
- [10] C. Lele, C. Wu, P. Weke, T. Mamadou and G.E. Njock, *Fuzzy ideals and weak ideals in BCK-algebras*, Scientiae Mathematicae Japonicae **54** (2001), 323–336.
- [11] C. Hoo, *Some fuzzy concepts of BCI, BCK and MV-algebras*, Int. J. Approx. Reason. **18** (2002), 177–189.
- [12] L.Z. Liu and K.T. Li, *Fuzzy filters of BL-algebras*, Information Sciences (In press).
- [13] Y. Huang and Z. Chen, *On ideals in BCK-algebra*, Math. Japonica **50** (1999), 211–226.
- [14] K. Iseki and S. Tanaka, *An introduction to the theory of BCK-algebra*, Math. Japonica **23** (1978), 935–942.
- [15] O.G. Xi, *Fuzzy BCK-algebras*, Math. Japonica **36** (1991), 935–942.
- [16] L.A. Zadeh, *Fuzzy sets*, Inform. and Control **8** (1965), 338–353.

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