Journal of Mathematical Research & Exposition
Vol.15, No.3, 366, Aug. 1995

A Note on Weakly Implicative Ideal *

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Keywords weakly implicative ideal, ideal, BCI-algebra.

Classification AMS(1991) 06F35, 03G25/CCL O153.1

The concept of weakly implicative ideal of BCI-algebra was introduced in [1]: an ideal of BCI-algebra is called weakly implicative if $(x^*y)^*z, y^*z \in I$, then $(x^*z)^*z \in I$.

The following results may be found in [1] and [2].

Proposition A (Lemma 1.4 of [1]) *If I is a closed ideal, then it is weakly implicative.*

Proposition B (Prop. 3.4 and Prop. 3.5 of [2]) *Ideal $M^{\perp}$ and ${}^{\perp}N$ are weakly implicative.*

We show here that weakly implicative ideal and ideal are equivalent concepts. Hence weakly implicative ideal is not new concept. In fact, by the definition of weakly implicative ideal, we may put $z = 0$, then weakly implicative ideal is ideal. On the other hand, we have

Proposition *In a BCI-algebra X, any ideal I is weakly implicative.*

Proof For any x, y, z in X, since

$$\begin{aligned}(((x^*(y^*z))^*z)^*z)^*((x^*y)^*z &\le ((x^*(y^*z))^*z)^*(x^*y) = ((x^*(y^*z))^*(x^*y))^*z \\ &\le (y^*(y^*z))^*z \le z^*z = 0.\end{aligned}$$

We have

$$((x^*z)^*z)^*(y^*z) = ((x^*(y^*z))^*z)^*z \le (x^*y)^*z.$$

Now if $(x^*y)^*z, y^*z \in I$, then $(x^*z)^*z \in I$. Hence I is weakly implicative.

Thus the Proposition A and B are clear.

References

[1] C.S.Hoo, *Closed ideals and p-semisimple BCI-algebras* ,Math. Japon., **35**(1990), 1103–1112.
[2] M.Aslam and A.B.Thaheem, *A note on p-semisimple BCI- algebras*, Math. Japon., **36**(1991), 39–45.

*Received Aug. 1, 1993.