INFINITE SUMS OF FUZZY NUMBERS

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Fuzzy numbers can be considered as a generalization of real numbers. Fuzzy number is a fuzzy subset of the real line R which is represented by its membership function. Fuzzy subset A of the real line is fuzzy number if it is normalized ($A(x) = 1$ for some $x \in R$) and convex (for all $x, y, z \in R$ such that $x < y < z$, it is $A(y) \geq \min(A(x), A(z))$).

A triangular norm (t-norm) is a binary operation on the unit interval $[0,1]$ such that for all $x, y, z \in [0,1]$ the following four axioms are satisfied: $(T_1)\quad T(x,y) = T(y,x)$, $\quad (T_2)\quad T(x, T(y,z)) = T(T(x,y),z)$, $\quad (T_3)\quad T(x,y) \leq T(x,z)$ whenever $y \leq z$, $\quad (T_4)\quad T(x,1) = x$.

Let $A_1, A_2, \cdots$ be a sequence of fuzzy number and let T be a t-norm. The finite T-sum of fuzzy numbers is defined by:

$$\begin{gathered}(A_1 \oplus_T A_2 \oplus_T A_3 \oplus_T \cdots \oplus_T A_n)(z) = \\ \sup_{x_1+x_2+x_3+\cdots+x_n=z} T\left(A_1(x_1), A_2(x_2), \cdots, A_n(x_n)\right).\end{gathered}$$

In this paper, we shall consider the infinite sums of fuzzy numbers with respect to the certain t-norms, as well as the connection between pseudo-convolution and addition of fuzzy numbers.