

1096-VR-2356      **Chuang Peng\*** (cpeng@morehouse.edu), Department of Mathematics, Morehouse College,  
Atlanta, GA 30314. *Algebraic Structure of Fuzzy Numbers*. Preliminary report.

This is the latest report in a series of work on developing a formal fuzzy number system, operations and its algebraic structures based on Zadeh's extension. The properties of fuzzy addition were discussed in an earlier work. In fact, the fuzzy numbers form a monoid under the fuzzy addition. It looks into its inverse operation - subtraction and develop a group structure for fuzzy number system, using the equivalent classes defined by symmetric fuzzy numbers. Moreover, on the fuzzy multiplication defined by Zadeh's extension, it proves that the well-known distributive laws hold, up to the equivalence relation. It then looks into the integral domain structure of the fuzzy numbers modulo by the equivalence classes defined by symmetric fuzzy numbers. Further algebraic properties, such as factorization, irreducibility and Euclidean division algorithm, will be discussed. (Received September 17, 2013)