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A Study of Fuzzy Derivations on Fuzzy Prime Near-Rings

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- (1) fuzzy group
- (2) fuzzy near-rings,
- (3) derivation.

Abstract

The purpose of this paper is to introduce and study the notion of fuzzy derivations on fuzzy near-rings, in the sense of fuzzy groups defined via fuzzy binary operations by Lee and Yuan [2]. Motivated by the classical theory of derivations on near-rings, we extend this framework to the fuzzy setting and establish basic structural properties of fuzzy derivations on fuzzy near-rings and fuzzy prime near-rings. In particular, we investigate how fuzzy derivations interact with fuzzy semigroup ideals and with the fuzzy multiplicative center, and we obtain conditions under which the image of a fuzzy derivation is contained in the fuzzy multiplicative center. As an application, we show that if every value of a nontrivial fuzzy derivation lies in the fuzzy multiplicative center, then the underlying fuzzy group of the near-ring is necessarily commutative, providing a fuzzy analogue of a well-known result from the ordinary near-ring theory.

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