On injectivity of a class of monotone operators with some univalency consequences

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Abstract

In this paper we provide sufficient conditions that ensure the convexity of the inverse images of an operator, monotone in some sense. Further, conditions that ensure the monotonicity, respectively the local injectivity of an operator are also obtained. Combining the conditions that provide the local injectivity, respectively the convexity of the inverse images of an operator, we are able to obtain some global injectivity results. As applications some new analytical conditions that assure the injectivity, respectively univalency of a complex function of one complex variable are obtained. We also show that some classical results, such as Alexander-Noshiro-Warschawski and Wolff theorem or Mocanu theorem are easy consequences of our results.