

# The right expression of the equivalent integral equation and non-uniqueness of solution of impulsive fractional order system

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## Abstract

The fractional derivatives are not equal for different expressions of the same piecewise function, which caused that the equivalent integral equations of impulsive fractional order system (IFrOS) proposed in existing papers are incorrect. Thus we reconsider two generalized IFrOSs that both have the corresponding impulsive Caputo fractional order system and the corresponding impulsive Riemann-Liouville fractional order system as their special cases, and discover that their equivalent integral equations are two integral equations with some arbitrary constants, which reveal the non-uniqueness of solution of the two generalized IFrOSs. Finally, two numerical examples are offered for explaining the non-uniqueness of solution to the two generalized IFrOSs.

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