



# The blow-up theorem of a discrete semilinear wave equation

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In this paper, the discretization of a nonlinear wave equation whose nonlinear term is a power function is introduced. The difference equation derived by discretizing the nonlinear wave equation has solutions which show characteristics corresponding to the characteristics of the blow-up solutions for the original equation. The initial value problem for the original equation has blow-up solutions when a certain condition is met. We prove that when a similar condition as that of the original solution is met in the initial value problem for the introduced difference equation, the introduced difference equation has blow-up solutions having characteristics corresponding to the characteristics of the blow-up solutions for the original equation.

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