

# Traveling waves in time dependent bistable equations

Wenxian Shen \*  
Department of Mathematics  
Auburn University  
Auburn University, AL 36849

## Abstract

The current paper is to explore traveling waves in general time dependent bistable equations. In order to do so, it first introduces a notion of traveling wave solutions in general time dependent equations, which is a natural extension of classical traveling wave solutions. The basic point of view in the paper is that traveling wave solutions are certain limits of wave-like solutions. It then introduces a notion of wave-like solutions and shows in terms of certain backward-forward limits that the existence of wave-like solutions in general time dependent equations implies the existence of traveling wave solutions. It is shown that wave-like solutions exist in time dependent bistable equations and hence traveling wave solutions exist in such equations. Moreover, it is shown that traveling wave solutions in a time dependent bistable equation are stable and unique. The results obtained in the paper extend many of the results on traveling wave solutions of time independent (periodic, almost periodic) bistable equations.

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