TRAVELING WAVES FOR
REACTION-DIFFUSION EQUATIONS WITH
TIME-DELAY AND NON-LOCAL RESPONSE

WENZHANG HUANG, UNIVERSITY OF ALABAMA IN HUNTSVILLE

Abstract: Many problems in biology and physics can be modeled by reaction-diffusion equations where the reaction term involves both the non-local response and time-delay effect. Same as the classical reaction-diffusion equations, one of important dynamical properties of this type of equations is the wave propagation that is described by a traveling wave solution. In this talk we show the existence of traveling wave solutions with large wave speed for a class of time delayed reaction-diffusions with non-local response. Our approach is first to transform the corresponding traveling wave equation to a singularly perturbed equation by a time scaling. We then convert the singularly perturbed equation into a regularly perturbed operator equation in a Banach space. The existence of traveling wave is therefore obtained by the application of Banach's fixed point theorem. An application to an age-structured population model will be presented.