Existence, uniqueness and stability of traveling wave fronts for delayed cellular neural networks

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In this talk, we are concerned with the existence, uniqueness and stability of traveling wave fronts for delayed cellular neural networks distributed in the one-dimensional integer lattice $\mathbb{Z}$. We first investigate the existence and nonexistence of traveling wave solutions by using the technique of monotone iteration method. Then we study the asymptotic behavior of traveling wave fronts as the moving coordinate tends to negative infinity. Based on the asymptotic behavior, we show that all traveling wave fronts are unique up to translation. Next, we consider the existence of solutions for Cauchy problem of the neural model. Using contraction principle, the techniques of semi-discrete Fourier transformation and comparison principle, we show that all solutions of the Cauchy problem converge exponentially to traveling wave fronts if the initial perturbations around the traveling wave fronts belong to a suitable weighted space.