On Principal Spectrum Points/Principal Eigenvalues of Nonlocal Dispersal Operators

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Abstract. This paper is to investigate the dependence of the principal spectrum points of nonlocal dispersal operators on underlying parameters. We study the effects of spatial inhomogeneity, the dispersal rate, and the dispersal distance on the existence of the principal eigenvalues, the magnitude of the principal spectrum points, and the asymptotic behavior of the principal spectrum points of nonlocal dispersal operators with Dirichlet type, Neumann type, and periodic boundary conditions in a unified way. Among others, we give the criteria for the existence of principal eigenvalues which is important in the nonlinear evolution equations with nonlocal dispersals.

Key words. Nonlocal dispersals, principal eigenvalues, spatial inhomogeneity, dispersal rate, dispersal distance.