Positive Stationary Solutions and Spreading Speeds of KPP Equations in Locally Spatially Inhomogeneous Media*

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Abstract. The current paper is concerned with positive stationary solutions and spatial spreading speeds of KPP type evolution equations with random or nonlocal or discrete dispersal in locally spatially inhomogeneous media. It is shown that such an equation has a unique globally stable positive stationary solution and has a spreading speed in every direction. Moreover, it is shown that the localized spatial inhomogeneity of the medium neither slows down nor speeds up the spatial spreading in all the directions.

Key words. KPP equations, random dispersal, nonlocal dispersal, discrete dispersal, localized spatial inhomogeneity, spreading speed, positive stationary solution, principal eigenvalue, sub-solution, super-solution, comparison principle.

Mathematics subject classification. 35K57, 45G10, 58D20, 92D25.

*Partially supported by NSF grant DMS–0907752