

Spectral Theory for Forward Nonautonomous Parabolic Equations and Applications

Dedicated to Professor George Sell on the occasion of his 70th birthday

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Abstract. We introduce the concept of the principal spectrum for linear forward nonautonomous parabolic partial differential equations. The principal spectrum is a nonempty compact interval. Fundamental properties of the principal spectrum for forward nonautonomous equations are investigated. The paper concludes with applications of the principal spectrum theory to the problem of uniform persistence in some population growth models.

Key words. Forward nonautonomous parabolic equation, principal spectrum, exponential separation, uniform persistence.

Mathematics subject classification. Primary: 35K15, 35P05; Secondary: 35K55, 35P15, 37B55, 92D25.

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