
Extensions of Freidlin-Gartner's formula to general reaction terms

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Abstract

The Freidlin-Gartner formula expresses the asymptotic speed of spreading for spatial-periodic Fisher-KPP equations in terms of the principal eigenvalues of a family of linear operators. One cannot expect the same formula to hold true for the other classes of reaction terms (monostable, combustion, bistable). However, these eigenvalues have been later related with the minimal speeds of pulsating travelling fronts, yielding a formula for the spreading speed which is not unreasonable to expect to hold for any reaction term. We will see that it is indeed the case. The method presented provides some partial results for equations whose terms depend arbitrarily on time and space, highlighting a general connection between the asymptotic speed of spreading and almost planar transition fronts.

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