A Geometric Approach to Counting Eigenvalues

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Abstract

In this talk I will demonstrate a geometrically inspired technique for computing temporal eigenvalues of linearised operators about travelling waves. Using the examples of the Fisher-KPP equation and a Keller-Segel model of bacterial chemotaxis, I will show how to produce an Evans function which is computable through several orders of magnitude in the spectral parameter and show how such a function can naturally be extended into the continuous spectrum. In both examples, I will use this function to numerically verify the absence of eigenvalues in a large region of the right half of the spectral plane.