Stability of trivial defect solutions

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Heterogeneous defects have been shown to have a profound impact on the existence and stability of localised solutions, potentially pinning, rebounding or annihilating travelling wave solutions. We examine pinned stationary solutions located near a jump-type defect for which substantial existence analysis exists showing there are three main types of solution, trivial defect solutions, local defect solutions and global defect solutions. The jump-type defect is simple enough to make analysis tenable but provides insight for future analysis of far more complicated heterogeneities. Through the use of an Evans function we locate the leading order spectrum of the general trivial defect solution which agrees with that of the associated homogeneous problem and derive the first order correction term, thus providing conditions for spectral stability to first order. The examination of the stability of the trivial defect solution is a crucial first step towards the analysis of the stability of local defect solutions.