Mathematical Physics

Reaction-diffusion front crossing a local defect

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The interaction of a Zeldovich reaction-diffusion front with a localized defect is studied numerically and analytically. For the analysis, we start from conservation laws and develop simple collective variable ordinary differential equations for the front position and width. Their solutions are in good agreement with the solutions of the full problem. Finally using this reduced model, we explain the pinning of the front on a large defect and obtain a quantitative criterion.

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