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Nonlocality-induced front interaction enhancement

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(Submitted on 14 Jun 2011)

We demonstrate that nonlocal coupling strongly influences the dynamics of fronts connecting two equivalent states. In two prototype models we observe a large amplification in the interaction strength between two opposite fronts increasing front velocities several orders of magnitude. By analyzing the spatial dynamics we prove that way beyond quantitative effects, nonlocal terms can also change the overall qualitative picture by inducing oscillations in the front profile. This leads to a mechanism for the formation of localized structures not present for local interactions. Finally, nonlocal coupling can induce a steep broadening of localized structures, eventually annihilating them.

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