

## Topological defects with power-law tails

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We study scalar field models with polynomial self-interaction. We write out conditions for the potential which are to be satisfied for kinks with power-law asymptotics to exist. Using the model  $\varphi^8$  as an example, we show that power-law asymptotics of kinks lead to their long-range interaction. Within the collective coordinate approximation we estimate the effective kink-antikink potential and force in two cases: for kinks with power-law asymptotics, and for kinks with exponential asymptotics. The numerical results from the collective coordinate approximation are compared to asymptotic estimates of the force of interaction via Manton's method. This long-range interaction can have substantial consequences for phenomenology of physical systems, the dynamics of which is described by field-theoretical models with polynomial potentials. In particular, domain walls in such models would interact at large distances.

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