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Wave-Packet Scattering off the Kink-Solution

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We investigate the propagation of a wave--packet in the ϕ^4 model. We solve the time-dependent equation of motion for two distinct initial conditions: The wave-packet in a trivial vacuum background and in the background of the kink soliton solution. We extract the scattering matrix from the wave-packet in the kink background at very late times and compare it with the result from static potential scattering in the small amplitude approximation. We vary the size of the initial wave-packet to identify non-linear effects as, for example, the replacement of the center of the kink.

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