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Tunneling and domain walls

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We consider a field theory model in 1+1 dimensions with a discrete internal symmetry. The model is such that the true vacuum respects this symmetry but it is broken in a pair of false vacua. Solitons interpolating between the false vacua necessarily pass through the true vacuum and are unstable. Adding a second scalar field, it is possible to stabilize the soliton against small fluctuations. Nonetheless, such a soliton will necessarily decay via quantum tunneling, just as the false vacuum itself is unstable. We analyse this phenomenon, and study whether the presence of solitons has a significant effect on the stability of a false vacuum.

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