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Decay of the false Skyrmions

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We consider the decay due to tunnelling of metastable Skyrmions that exist in the false vacuum. The possible mass term for the pions explicitly breaks the chiral symmetry. The only phenomenological constraint on the mass term is that the resultant pion mass be small. This allows for the possibility of local minima of the potential, which could give rise to metastable, so-called false vacuum configurations. The false vacuum can decay due to instantons, however, it can also entrap false Skyrmion configurations, which are unstable due to quantum tunnelling. We establish the existence of the false Skyrmions, and we compute the decay rate of the false Skyrmions in the thin wall limit.

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