

Mass of quantum topological excitations and order parameter finite size dependence

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We consider the spontaneously broken regime of the $O(n)$ vector model in $d = n + 1$ space-time dimensions, with boundary conditions enforcing the presence of a topological defect line. Comparing theory and finite size dependence of one-point functions observed in recent numerical simulations [1,2] we argue that the mass of the underlying topological quantum particle becomes infinite for $d \geq 4$.

[1] G. Delfino, W. Selke and A. Squarcini, Phys. Rev. Lett. 122 (2019) 050602.

[2] M. Panero and A. Smecca, JHEP 03 (2021) 231.

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