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Second order chiral phase transition in three flavor quantum chromodynamics?

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We calculate the renormalization group flows of all renormalizable interactions in the three dimensional Ginzburg–Landau potential for the chiral phase transition of three flavor quantum chromodynamics. On the contrary to the common belief we find a fixed point in the system that is able to describe a second order phase transition in the infrared. This shows that longstanding assumptions on the transition order might be false. If the transition is indeed of second order, our results can also be interpreted as indirect evidence that the axial anomaly restores at the transition temperature.

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