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Chiral Potts Spin Glass in $d = 2$ and 3 TOLGA CAGLAR, Sabanci University, A. NIHAT BERKER, Sabanci University and Massachusetts Institute of Technology — The chiral spin-glass Potts system with $q = 3$ states is studied in $d = 2$ and 3 by renormalization-group theory.[1] Global phase diagrams are calculated in temperature, chirality concentration p, and chirality-breaking concentration c, with determination of phase chaos and phase-boundary chaos. In $d = 3$, the system has ferromagnetic, left-chiral, right-chiral, chiral spin-glass, and disordered phases. The boundaries to ferromagnetic, left- and right-chiral phases show, differently, and unusual, fibrous patchwork (microreentrances) of all four (ferromagnetic, left- and right-chiral, chiral spin-glass) ordered phases, especially in the multicritical region. The chaotic behavior of the interactions under scale change are determined in the chiral spin-glass phase and on the boundary between the chiral spin-glass and disordered phases, showing Lyapunov exponents in magnitudes reversed from usual ferromagnetic-antiferromagnetic spin-glass systems. In $d = 2$, the chiral spin-glass Potts system does not have a spin-glass phase.

[1] T. Çağlar and A.N. Berker, Phys. Rev. E 94, 032121 (2016)

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