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Universality away from Critical Points: Collapse of Observables in a Thermostatistical Model CINTIA LAPILLI, PETER PFEIFER, CARLOS WEXLER, Department of Physics and Astronomy, University of Missouri-Columbia, Columbia, Missouri 65211, USA — The p-state clock model in two dimensions is a discrete model exhibiting, for $p > 4$, a quasi-liquid phase in a region $T_1 < T < T_2$. We show that above a temperature $T_{\rm eu}$ the model exhibits *extended universality* in which, for $p > 4$ and all $T > T_{\rm eu}$, all thermal averages become identical to those of the continuous, planar rotor model ($p = \infty$). This *collapse of thermodynamic observables* amounts to an emergent symmetry, not present in the Hamiltonian. For $p \geq 8$, the collapse starts in the quasi-liquid phase and makes the transition at T_2 indistinguishable from the Berezinskii-Kosterlitz-Thouless (BKT) transition of the planar rotor. For $p \leq 6$, we find $T_{\rm eu} > T_2$, and the transition at T_2 is no longer BKT. The results include a detailed analysis of the critical properties at T_1 and T_2. Broader implications are discussed.

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