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**Colossal magnetoresistance effect in double exchange models with Potts and Ising variables** CENGIZ SEN, EMILY OCHOA, Lamar Univ, ELBIO DAGOTTO, University of Tennessee, LAMAR/UTK COLLABORATION — Two-orbital model with Jahn-Teller phonons for colossal magnetoresistance is investigated at an electronic density of  $n = 0.75$  where: 1) Mn spins are treated classically with a 4-state Potts model with up/down/right/left directions, and 2) Ising spins with only up/down directions. These results are compared to those of earlier studies where a new state was found that had both FM and CE-like characteristics, which made use of classical Heisenberg spins.[1] With both the 4-state Potts and Ising spins, we see large CMR peaks, similar to that observed in [1]. We conclude that while the existence of this new state may explain nanoscale phase separation tendencies in CMR manganites, it may not be directly responsible for the large resistivity peak, confirming earlier results.[2]

1. C. Ş., Shuha Liang, and Elbio Dagotto, Phys. Rev. B **85**, 174418, 2012.
2. C. Ş., Gonzalo Alvarez, and Elbio Dagotto, Phys. Rev. Lett. **105**, 097293, 2010.

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