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Computational study of the ZGB model with a long-range interaction[1] CHOR-HOI CHAN, PER ARNE RIKVOLD, Florida State University — The Ziff-Gulari-Barshad (ZGB) model is widely used to study the oxidation of carbon monoxide (CO) on a catalyst surface. The model exhibits a non-equilibrium, discontinuous phase transition between a reactive and a CO poisoned phase. If one allows a nonzero rate of CO desorption (k), the line of phase transitions is terminated at a critical point (k_c). In this work, instead of restricting the CO and atomic oxygen (O) to react only when they are absorbed in close proximity, we consider a theoretical model that allows CO and O atoms adsorbed far apart on the lattice to react to form carbon dioxide (CO_2). We employ Monte Carlo simulations to study changes in the physical properties of the system, especially the universality class of the critical point. Through this study we hope to gain further understanding of the ways that a long-range interaction can affect an originally short-range interacting non-equilibrium system.

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Chor-Hoi Chan
Florida State University

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