

Abstract Submitted
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Strong correlation effect in Fullerene C₂₀¹ FEI LIN, Physics Department, University of Illinois at Urbana-Champaign, IL, USA, ERIK SORENSEN, CATHERINE KALLIN, JOHN BERLINSKY, Department of Physics and Astronomy, McMaster University, Hamilton, ON, Canada — Successful synthesis of the gas-phase dodecahedral C₂₀ molecule [Nature 407, 60 (2000)] has stimulated great interest in this material. In this talk we report exact diagonalization and quantum Monte Carlo simulation results on the C₂₀ molecule and a possible solid structure [Phys. Rev. B 76, 033414 (2007)]. Our results suggest that strong electronic correlations suppress the Jahn-Teller effect on the dodecahedral molecule, and make the solid an insulator. We also determine the critical value of the interaction strength for the metal-insulator transition.

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